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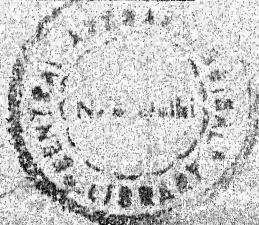
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## Outline of Chang Grammar.

By J. H. HUTTON.

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The Hon'ble Mr. Jus

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L. L. Fermor, Esq., C

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## PREFACE.

The Chang tribe is one of those Naga tribes which occupy the hinterland, as it were, of the Naga Hills district, stretching back to the high range, which divides Assam from Burma. Only two small Chang villages of mixed population fall far enough west to come within the boundary of the administered district, the bulk of the tribe being situated in the area of loose political control which forms a buffer between the district and the still unknown tribes which occupy the slopes of the high range on both the Assam and Burma sides.

As a tribe the Changs are parvenus. About eleven generations ago, according to their own reckoning, the present village of Tuensang, the fountain head of the tribe, was founded by elements coming from the south, from the Central Naga tribe known as Yimtsungr, in combination with Konyaks of the eastern Naga group from the defunct village of Changsung, situated to the north-east of what is now Tuensang. This mixture of elements is very patent in Chang culture. Some bury their dead, as the Yimtsungr do, while others expose their corpses on platforms in the Konyak manner; the village of Tuensang is composed of four clans grouped two by two who indulge in the most bitter faction fights; the Ung clan corresponding to the Ang, or chiefly, clan of the Konyak tribes and the Pongen, the doyen of the three phratries of the Ao tribe, is regarded with contempt and aversion, but nevertheless performs certain priestly functions and seems to be in some way credited with magical knowledge; the warrior's tattoo patterns are of Konyak affinities, but their breech clout is Yimtsungr, and so forth. But although the two cultures are as yet incompletely fused, the people themselves have blended completely, and the physical type which has resulted from the hybridization of the two tribes is not only very pronounced, but is excessively vigorous. In all directions the parent village of Tuensang (known to the Aos as Mozungjami) has thrown out offshoots which have conquered and practically absorbed the neighbouring tribes, and which have spread the influence and the mixed culture of the conquerors even beyond the area of actual subjugation, so that Sangtam villages to the south and Phom villages to the north are becoming assimilated to the Changs in between. Eastward the expanding Changs have come up against the very warlike Kalyo-Kengyu tribe that lives on the inhospitable heights of the Saramati range, and, for the time being, their expansion has been brought to a stop. Westwards the Changs started by decimating the villages of their Ao neighbours, followed by annexing their lands and occupying their site and allowing

those of the former owners that survived to come back as subjects, and this process was only stopped by the British occupation of the Ao country. The Changs, desperately democratic in the parent village of Tuensang, have, outside it, a chiefly polity, and the chief is no *roi fainéant*. Generally speaking, however, the culture is more Yimtsung than Konyak. The physical type is distinctive, the majority of Changs being tall out of proportion to their girth and markedly long in the leg in proportion to the trunk. Their heads, in so far as I have taken measurements, show even more decided dolichocephaly than those of the general run of Konyaks, but give a much lower nasal index.

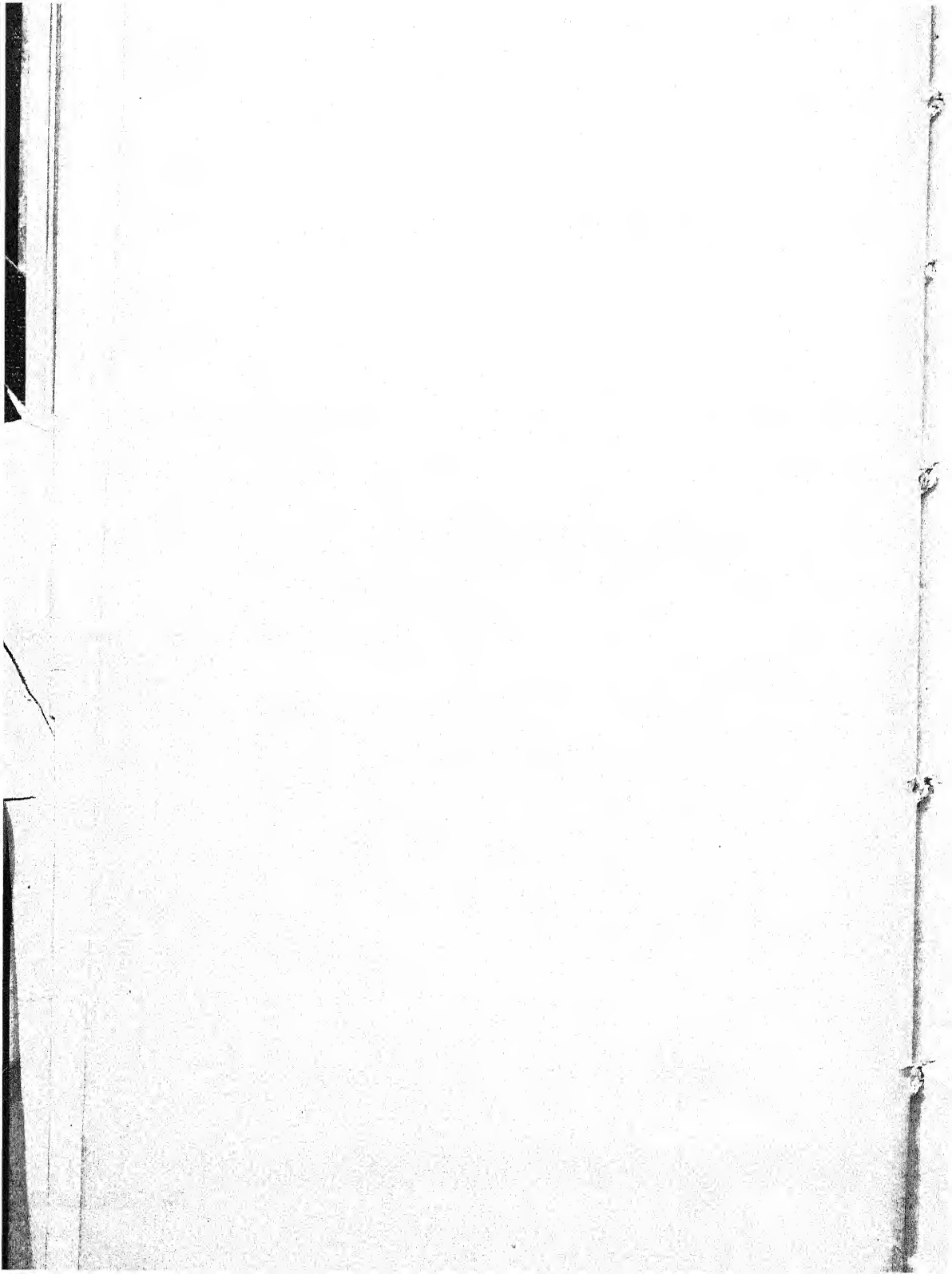
The language is less hybrid than the blood, as the Konyak element seems to have predominated in speech in proportion as it has succumbed in culture. Sir George Grierson finds the most nearly allied tongue to be that of the Konyak village of Zu, or "Banfera," much further north, but the dialects of the intervening Konyak villages are still mostly unrecorded, and it is probable that there are Konyak dialects akin to Chang very much near the Chang tribal area than Zu. Nothing is known, beyond a few odd words, of the Yimtsung language, but that the element is not entirely absent from the Chang language is to be inferred from the occurrence of such words as *milishen*, for instance, for 'rainbow,' the almost identical word (*milesü*) occurring in the Sema Naga language where it is a loan word probably from Yimtsung or Sangtam. The extent however, to which the Konyak element has prevailed in Chang speech is to be inferred from the absence of *R*, which is regularly used by the Yimtsung but which the Konyak group cannot pronounce at all. A little miscellaneous information as to the Chang tribe will be found in Appendix III of *The Angami Nagas* (Macmillan, 1921) and in my diaries of "*Two Tours in the unadministered area east of the Naga Hills*" (Asiatic Society of Bengal, Memoirs, XI, 1921), but the only notice of the Chang language that has hitherto appeared is in Sir G. Grierson's *Linguistic Survey of India*, vol. III, pt. ii., where a vocabulary of specimen words is given together with some illustrative sentences. Unfortunately these sentences could only be recorded (by the late Mr. Noel Williamson, then Subdivisional Officer of Mokokehung) by means of an Ao interpreter from a Chang who spoke Ao, and this devious method, though well enough when merely the name of a familiar object was required, led through misunderstandings, no doubt on both sides, to considerable inaccuracies in recording sentences which occasionally bear little relation to the English they were intended to translate. The rough outline of the grammar and the limited vocabulary that follow here were the results of the writer's efforts to acquire the Chang language at Mokokehung between 1915 and 1917, and he is fully conscious of their shortcomings, but hopes that their publication is

justified by the fact that up to the present no other attempts have been made to learn the tongue or to give any account of it. The language is a difficult one not only by reason of its tones but owing to the fact that the negative of the verb is formed by prefixing a single vowel, and that where the root already begins with a vowel, as it frequently does, the negative is merged in the root, often having merely the effect of a subtle difference in the length of the latter vowel which the writer, at any rate, has found extremely difficult to discriminate when listening to continuous speech. It is easy, for instance, to write *ōlenta*, 'is glad', *ōlenta*, 'is sorry,' but to differentiate them as spoken by a Chang tribesman needs a very accurate ear. An apology is also needed for the failure to make any attempt at the systematic indication of tones. When the record was made, Sir G. Grierson's note *On the Representation of Tones in Oriental Languages* was, if published, unknown to the writer, and he has had no opportunity since of rewriting the whole with the proper tones, and it is extremely improbable that such an opportunity would ever recur to him now. The record is therefore published for what it is worth in the hopes that it may serve temporarily to fill a gap in our knowledge of Tibeto-Burman languages and prove of use to these officers who may have dealings with one of the more important Naga tribes, and instigate by its faults the production of a fuller and more perfect account in the future.

KOHIMA,  
May, 1929.

J. H. H.





## CHANG ALPHABET.

### VOWELS.

- a .. { long (ā) .. as in "father", (*e.g.* **māng**= 'mind')  
 { sharp (à) .. as in "fatter", (*e.g.* **yànashi**=go down)  
 { short (ă) .. as u in "flutter" (*e.g.* **măng**=body)

*N.B.*—An indeterminate a similar to the a in the German **mann** is very common, and is perhaps the normal value of a in Chang Naga, *e.g.* the a in the word **Chang** itself.

- e .. { long (ē) .. as a in "fate" (*e.g.* **lēke**=took)  
 { short (ĕ) .. as in "fetter" (**lĕnashi**=explain)  
 i .. { long (ī) .. as in "machine" (**phīashi**=ask)  
 { short (ĭ) .. as in "mince" (**īnashi**=give to drink)  
 o .. { long (ō) .. as in "go" (**lōta**=is coming)  
 { short (ö) .. as in "got" (**uyök**=spittle)  
 { broad (ô) .. as in (?) "gone"  
 (Not as broad as oa in that word) (**môli**=medicine)  
 u .. { long (ū) .. as oo in "pool" (**chung**=many)  
 { short (ü) .. as in "pull". (**khŭn**=hat)

ü .. somewhat resembling the u sound in churn or burn, but shorter and perhaps approximating sometimes to the ü in German **brüder**, (**mügh**=sky).

### DIPHTHONGS.

- ai as in "aisle" (**maike**=is well)  
 au as ow in "cow", (not as in "caul" or "maul") (**ngau**=fish)  
 ao slightly longer than au as ow in "howl" (**ao**=bird)  
 ei is ē lengthened by ĭ and slightly longer than ē (**tei**=water)  
 ie ,, ī ,, ,, ĕ ,, ,, ,, ī (**chie**=one)  
 ou ,, ō ,, ,, ŭ ,, ,, ,, ō (**sou**=ghost)  
 oa as in "boa" "Troad", oe as in "poem", but the two vowels in each case sometimes slurred almost into one sound;  
 ua, uo also on the same principle.

*N.B.*—The difference between ō and ou and between ī and ei frequently depends merely on the rate at which the word is spoken, and ou and ei in simple words usually become ō and ē in compounds unless they occur in the final syllable of the compound word.

### CONSONANTS—(a) simple :—

- B as in English. *e.g.* (**bā**= "garden")  
 D dental. ,, (**dŭtchi**= "oil")  
 F as in English. ,, (**fulabu**= "will place")

- G hard, as in English 'gun', (*e.g.* **gulabu**="will sweep"); **ng** as in "singing", (*e.g.* **ngôk**="hoof"), never as in "finger."  
H as in English, but pronounced where written, (*e.g.* **hin**="crab").  
J as in English 'joy', (*e.g.* **jămpăn**="sept").  
K as in English, (*e.g.* **kăn**="wild cat", *felis bengalensis*).  
L " " " (, **lulu**="apart").  
M " " " (, **mîn**="ant").  
N " " " (, **nei**="cloth").  
P " " " (, **piapoa**="anciently").  
R probably non-existent in pure Chang. If found sounded as in English 'very'—(*e.g.* **kuk-kur-gu**="cock-a-doodle-doo").  
S sibilant, as in English 'sense' (*e.g.* **săp**="bear").  
T dental, (*e.g.* **tāk**="back" (n.).  
V as in English, (, **savesai**="confusion").  
W " " " (, **wo**="axe").  
Y always consonantal, never a mere vowel, (*e.g.* **yei**="breeze").  
Z as in English (*e.g.* **lilisizepu**="swashbuckler").

*N.B.*—D and V are uncommon, F and Z very rare indeed. P, B. & V are often inter-changed, particularly P & B, between which the Chang ear does not seem to distinguish, as also in the case of D & T, G & K, J and CH, and often CH & SH.

(b) aspirated :—

- CH as in English 'church', (*e.g.* **chanyu**="sun").  
GH guttural and lightly sounded, the G hardly at all; never carried on to the subsequent syllable, (*e.g.* **lũgh**="rope").  
KH as in English 'workhouse', (*e.g.* **khu**="head").  
KH highly aspirate as CH in Scottish 'loch' or GH in Irish, (*e.g.* **khũgh**="hardship").  
PH as in English 'uphold', not as F, (*e.g.* **phōpan**="in excess").  
SH as in English 'shape', (*e.g.* **shāp**="hoe").  
TH " " " 'priesthood', (*e.g.* **thũnyũ**="elephant").  
ZH if found, as S in English 'treasure' or J in French '*jour*'.  
Other aspirated consonants on the analogy of PH and TH.

SIGNS.

An **apostrophe** thus —' signifies a letter (ordinarily a vowel) omitted.

Reversed thus—' it signifies a pause in enunciation.

The **diaeresis** (· ·) is used, except in the case of the vowel ü, to mark the separate pronunciation of contiguous vowels ordinarily forming a diphthong.

## EUPHONY.

Certain consonants change in the Chang language when following or preceding certain other consonants.

**B** after **G** or **P** becomes **P**

**G** after **M** becomes **B**

**G** before **L** sometimes becomes **K**

**K** after **M** or **P** becomes **P**

*e.g.* **chămpa** for **chăm-ka** "From (the) house"

**hăp-pē** for **hăp-kē** "know", "found", "got"

**K** after **G** sometimes becomes **G**, *e.g.* **sug-gē** for **sug-kē**

**K** before **S** frequently becomes **P**

**K** before **B** or **P** sometimes becomes **M**

**T** before **K** often becomes **K** *e.g.* **asăkkē** for **asătkē** "did not sit".

## TONE.

As in all Naga languages difference of meaning depending on the tone in which a word is spoken is a fertile source of difficulty. In Chang, as in Sema, three tones may be distinguished, but the difference is very often so slight as to be indistinguishable to any but a Chang. A few instances are given, *h* standing for 'high', *m* for 'medium', and *l* for 'low' pitch :—

<b>mũgh</b> , <i>h</i>	= sky	<i>l</i>	= hunger.
<b>chăm</b> , <i>h</i>	= salt	<i>l</i>	= house.
<b>tei</b> , <i>h</i>	= there	<i>l</i>	= water.
<b>wan</b> , <i>m</i>	= fire	<i>l</i>	= winnower.
<b>lăng</b> , <i>m</i>	= stone	<i>l</i>	= horn.
<b>uwi</b> , <i>m</i>	= soap	<i>l</i>	= nasal excretion

Likewise the difference between **kăm** (*h*) = "do" and **kămm** *l* = "forbid" is very slight.

There are also words with two meanings where there is no difference in tone, *e.g.* :—

<b>lăng</b>	(1) thatch,	(2) rain.
<b>măng</b>	(1) shadow,	(2) dream.
<b>săt</b>	(1) dung,	(2) eight, (3) to sit.
<b>săn</b>	(1) liver,	(2) breast.
<b>lam</b>	(1) path,	(2) indigo ( <i>N.B.</i> — <b>lam</b> ( <i>h</i> ) = otter).
<b>chak</b>	(1) dish,	(2) thorn.
<b>shi</b>	(1) hunt,	(2) sew.

There are also many different words whose difference depends solely on a very slight change of vowel such as **chie** = "one", **chī** = "brass-armlet", **chĩ** = "not so" **măng** = heart, mind, **măng** = body.

The verbs **hau** = "go" and **hau** = "hit" (a mark), as well

as hau = "gather up" are pronounced almost identically in the positive use, but the first makes as its negative oho and the two latter uhau. Hau, the noun, = "sinew".

## NUMERALS.

1 Chie	140 Sau-nyet
2 Nyi	150 Anchin'săt
3 Săm	160 Sau-săt
4 Lei	170 Anchin'guh
5 Ngau	180 Sau-guh
6 Lăk	190 Anchini 'an
7 Nyet	200 Sau'an
8 Săt	201 Sau'an-to-chie
9 Guh	210 Sau'an-to-an
10 An	220 Sau'an-to-sauchie
11 Antăkchie	300 Sau'an-to-saungau
12 Antăknyi	310 Sau'an-to-anchin'lak
19 Antakguh	400 Sau'an-nyini
20 Sau-chie	401 Sau'an-nyini lan chie
21 Sau-to-chie	402 Sau'an-nyini lan ni (or păn ni)
22 Sau-to-nyi	410 Sau'an-nyini lan an (or pan an or to-an).
29 Sau-to-guh	420 Sau'an-nyini lan sauchie
30 Kujin	500 Sau'an-nyini lan saungau
31 Kujin-to-chie	600 Sau'an-sămni
40 Sau-nyi	700 Sau'an-samni lan saungau
50 An-chin'-săm	800 Sau'an-leini
51 An-chin'-săm-to-chie	900 Sau'an-leini lan saungau
60 Sau-săm	1,000 Sau'an-ngauni
70 Anchin'lei	1,100 Sau'an-ngauni lan sau-ngau
80 Sau-lei	1,200 Sau'an-lăkni
90 Anchiningau	1,300 Sau'an-lăkni lan saungau
100 Sau-ngau	1,400 Sau'an-nyetni
101 Saungau-to-chie	1,600 Sau'an-sătni
110 Anchin'lak	1,800 Sau'an-guhni
111 Anchin'lak-to-chie	2,000 Sau'an anni (or anli)
120 Sau-lak	
130 Anchin'nyet	

It will be noticed from the list of the above numerals that the Chang numeration is based on a double system. Up to 19 the reckoning is absolutely straight-forward, then we start with "one score" the basis of calculation up to 200, except for the thirties. Thirty has a term of its own, **Kujin**, after which we start off with "two score," the denominators of double figures from 40 upwards being calculated with the score as a basis while the numerators are reckoned as usual by tens. The odd multiples of ten that fall between the scores are reck-

oned back from the nearest score in excess of them. Thus for 40 we have "two score" and for sixty "three score" while fifty in between is "ten short of three (score)." This goes on naturally up to two hundred in regular sequence of tens instead of up to 100 as in English. From this point "ten score" is the starting point for calculation. After 200 the numerals merely repeat themselves by adding so much to "ten-score" up to 400. Thus three hundred is "ten-score and five-score," when 399 will be "ten score, and ten short of ten (score), and nine". 400 is double "ten score" and the reckoning goes on as in the case of ten score figures, up to "double ten score and five score" (500), "thrice ten score" "(600), thrice ten score and five score" (700) and so on up to 1,000, "five times ten score" and 2,000, "ten times ten score." Provided it is remembered that up to 200 the odd tens are reckoned from the score in excess of them the system is simple enough as after 200 ten score is added to and multiplied but there is no counting backwards except in so far as numerals already fixed are employed; that is to say that, though fifty is reckoned back from 60 being the "ten short of three (score)," 500 is not reckoned back from 600 but is merely 400 and 100, "twice ten score and five score."

The word *pām*—"a piece," "a head," (before a simple *n* it becomes *păn*) is used with numeral, e.g., "I have five cows" *ngeibu masu pam ngau kia* (my cows heads five are), 2 rupees—*Nām pan nyi*.

#### ORDINALS.

- 1st *shangbu*
- 2nd *nyibu* or *nyipobu*
- 3rd *sambu* or *sampobu*
- etc.

'First' the adverb,=*shang* or *shanga*.

'First' the adjective (*shangbu*) becomes *shangpou* or *shangnyu* if a male or female is definitely indicated.

'Last'=*paibu* which is used exactly like *shangbu*.

Those in between the first and the last are called *chinyuk-abu* or *aulangkabu*.

'I arrived first'—*ngo shang sügh-ke*.

'In the women's dance Aleng was first'—*Yaksa-tompuka Aleng shangnyu*.

#### DISTRIBUTIVES.

- Singly—*chie chie*
- By twos—*nyi nyi*,
- etc.



## NUMERAL ADVERBS.

Once—chiong  
 Twice—nyini  
 Thrice—samni  
 Four times—leini  
*Etc.*

## ARTICLE.

There is no article strictly speaking in Chang Naga. For the indefinite article the numeral **chie**, "one," is used, following the noun, *e.g.* **măt chie** = "a man." For the definite article **ho**, "this," and **khwo**, "that," are used, preceding the noun.

## NOUN.

Unlike the Naga languages of the western group the Chang noun does not retain any particle prefixed to the noun (Grierson says that this is the survival of an obsolete possessive) and dropped when the noun is used in conjunction with governing words. There is nothing in Chang answering to the prefix **te**—common in Angami or **a-** which is universal in Sema, except in the case of the names of some relatives. These all begin with a superfluous **a-** which disappears when the word is governed by a possessive pronoun *e.g.* **apo** = father, **kă-po** = my father (used in address and also speaking to a third person).

**jai**, **ajei** = elder brother, **kă-jei** = your elder brother.

## GENDER.

For words denoting human beings distinct forms are used, though the particle **pō** or **pou** is distinctive of males and **nyu** of females where they are used. *E.g.*

**pōsu** = a man (as opposed to woman) **yaksa** = a woman.  
**pōkwa** = an elderly man, **nyukwa** = an elderly woman.  
**paushipou** = an old man, **paushinyu** an old woman.  
**heshou** = a boy or young man, **mătei** = a girl.

In the case of animals separate terminations are in use to distinguish males, females that have given birth to young, and females that have not so given birth, *viz.* :—

Male	Female	Female that has not given birth
-pāng	-pi	-sawanyu
-lo	-nyu.	

The use of the alternative forms for the first two is governed by conventions which generally speaking do not seem based

on anything but caprice, though the masculine form in *-pāng* seems to be always used of deer, cattle, and larger mammals.

Examples :—

cow=masu > masupang*	masupi	masusawanyu
a bull	a cow	a cow that has not calved
mithan=ngo > ngopang	ngopi or ngonyu	ngosawanyu
a bull mithan	a cow mithan	a cow mithan that has never calved.
dog=kei > keilo	keinyu	keisawanyu
a dog	a bitch	a bitch that has never whelped.
fowl=aunok > aupang	aunyu	ausan' (for ausawanyu)
a cock	a hen	a pullet

\* As well as *masupang* for 'a bull,' *masupangsu* is used if the bull has a developed hump.

To denote the young male of any species—*shou* is suffixed to the masculine form, thus a young bull=*masupangshou*. For the quite young offspring, the same *shou* (originally='son') or *shōshou* is suffixed to the simple form of the noun; thus *ngoshou* = a mithun calf (of either sex), *masushoshou* = a calf.

#### NUMBER.

Separate form for the dual and plural numbers exist in the Chang language in the case of the personal pronouns, and are given under that heading. In the case of ordinary nouns *-ong* is added to make a collective plural and *shoung* is also used with similar effect, though neither are necessarily employed if the sense is clear without. *Shoung* is really in itself a noun denoting a company or "group," and may also be suffixed to the plural forms of the personal pronouns. When *ong* is used, it is placed after the case inflection, but *shoung* before it :—  
I will feed the dogs = *keil'ong auklam* (not *keiongla*).

*Māt-shoung loake* = men came.

*Hawan-shoungto ngampe* = I beat them.

#### CASE.

Unlike the Western Naga languages, Chang has a definite series of case inflexions, consisting of the following suffixes :—

Agentive—e, ye	by
Genitive—bu, ebu, webu,	of
Locative—a	on, at
Ablative—ka	from
Dative—la	for, to
Accusative—to, cha	to.

The Agentive case is used for the subject of all verbs regarded as transitive, which includes verbs of speaking even

though no object is expressed, as well as others which Europeans would scarcely assign to that category.

The **Genitive** termination is added to the Agentive in some cases, that of the pronoun of the first person for instance, while the termination **-bu** signifying possession is used to form adjectives and some parts of verbs as well as the Genitive of nouns.

The **Locative** case denotes rest at a place.

The **Ablative** case denotes separation from the noun, (accompaniment is expressed by the use of the post-position **paito**).

The **Dative** case is used of the person or thing for the benefit of which something is done, or to whom something is given or spoken, though the accusative is also used for this latter.

The **Accusative** case denotes the object of a transitive verb though the inflection is by no means always used. It is also the case of the place (but not the person) to which motion is directed; (with the person towards whom motion takes place the postposition **chungto** is used).

Numerals used with the noun precede the case inflection, e.g. :—

‘I will feed two dogs’ = **kei-ni-la auklam** (not **keila-ni**).

Examples :—

Nominative—‘I will go’	= <b>ngo haulabu</b> .
‘The mynah flew’	= <b>ausung pia</b> .
Agentive—‘I will speak’	= <b>ngē laulam</b> .
‘Ongli will speak’	= <b>Ongli laulam</b> (no inflection).
‘The mynah will speak’	= <b>ausunge laulam</b> .
Genitive—‘My word’	= <b>ngēbu ngūgh</b> .
‘The woman’s dog’	= <b>yaksabu kei</b> .
Locative—‘It is in the house’	= <b>chāma kia</b> .
‘Yanchu is at Yongemdi’	= <b>Yanchu Yongemdi-a kia</b>
Ablative—‘I got (it) from Mongko’	= <b>ngē Mōngkōka hăppē</b>
‘he brought (it) from the house’	= <b>haue chāmpa songbakē</b> . ( <i>N.B.</i> — <b>chām-pa</b> for <b>chāmka</b> ).
Dative—‘Gave it to him’	= <b>haua kūkē</b> .
‘I brought it for Ongli’	= <b>ngē Onglila songbakē</b> .
Accusative—‘(He) hit me’	= <b>kăto ngămpē</b>
‘(he) spoke to me’	= <b>kăto laukē</b>
‘(he) went to his house’	= <b>hauebu chămtō haukē</b> .

Example :—

Declension of **sang**.

Nominative	<b>sang</b> —Village.
Agentive	<b>sange</b> —(by) the village.
Genitive	<b>sangbu</b> —of the village.
Locative	<b>sanga</b> —at the village.

Ablative	sangka—from the village.
Dative	sangla—for the village.
Accusative	sangto—to the village.

## ADJECTIVE.

The adjective follows the noun which it qualifies and may usually be distinguished from it at once by the adjectival termination *-bu* (or *-pu*) *e.g.*, *maibu*=good, *hambu*=small, *yangpu*=large, *nakübu*=black, *säklängbu*=red, *tupaibu*=white.

*N.B.*—The final *-u* is often aspirated as though it were *uh*, though this is not always noticeable in conversation.

When, however, the adjective is enclitic or is used as an appellation in the vocative, the termination *-bu* is usually dropped.

*e.g.*

*mättnak*, *matnakü*=a black man.

*mätsak*=a red man.

*mätthu* (or *mätthupaibu*)=a white man.

*mätmai*=a proper man, *i.e.*, a Naga,

(as opposed to a stranger from the direction of Assam or Burma).

*Nakü*=‘o black one!’

Ordinarily the adjective follows the noun qualified *e.g.*

In *hambu songba*=“bring the small dao (in)”.

*Ngebu kei tupaibu*=“my dog is white” (or “my white dog”).

## COMPARISON.

When two objects are compared, the one with which the comparison is made is followed by the word *tauchi* or *tochi*=‘than’, *e.g.*, ‘my dog is better than yours’=*kābu kei-tauchi*  
your dog than

*ngebu kei mai-ke.*

my dog is-good.

The superlative is expressed by using some such term as *aibu*=‘very,’ or *pändoto* (< *pando*=‘all’), thus:—

‘His dog is best of all’=*haebu kei pandoto maike*  
his dog of all is good

(or *aibu maike*).

very good is.

Intensive forms may be formed from adjectives by the addition of certain suffixes such as *-shou* (lit.=‘son’), *-tam*, *-shet* (lit.=‘spoilt’), etc.

*e.g.*

maibu=good >

maibu-shou } =very good.  
maibu-tam }

akpu=sharp >

akpu-tam } =very sharp.  
akpu-shou }

amai=bad >

amai-shet=very bad.

*N.B.*—These suffixes are idiomatic. “amai-shou” or “amai tam” could not be used any more than one could say “maibu-shet.”

### PRONOUNS.

**PERSONAL PRONOUNS:**—These are declined in both singular, dual and plural numbers, the Locative case being naturally not in use. The dual and plural of the first person have different forms according as the person addressed is included or excluded.

#### FIRST PERSON.

	<i>singular</i> I	<i>dual</i> We two		<i>plural</i> We	
		<i>Inclusive</i>	<i>Exclusive</i>	<i>Inclusive</i>	<i>Exclusive</i>
Nominative	ngo	săji (or sătî)	kăsi	sănn	kănn
Agentive	ngē	săjihame	kăse	săne	kăne
Genitive	{ ngebu kăbu	săjibu	kăsibu	sănebu	kănebu
Ablative	kăka	săjika	kăsika	săneka	kăneka
Dative	kăla	săjila	kăsila	sănela	kănela
Accusative	kăto	săjito	kăsito	săneto	kăneto

*N.B.*—In the first person the form *kă* has been used for the root, but *kū* is used in some villages, and would be more convenient for general use if the long and short marks were not used.

The form *săji* (or *sătî*) is used when the person addressed is included, *kăsi* when he is not; similarly *sănn* is used when the person spoken to is so included and *kănn* when he is not.

#### SECOND PERSON.

Nominative	nô	kăsi	kănn
Agentive	nyi	{ kăsi-hame kăse	kăne
Genitive	kăbu	kăsibu	kănebu
Ablative	kăka	kăsika	kănka
Dative	kăla	kăsila	kănla
Accusative	kăto	kăsito	kănto

## THIRD PERSON.

Nominative	hau	hausi	hauan
Agentive	haue	hausi-hame	hauane
Genitive	hauebu	hausibu	hauanebu
Ablative	hauka	hausika	hauanka
Dative	haua	hausila	hauanla
Accusative	hauto	hausito	hauanto

Sometimes the nominative is used where an accusative might be expected, *e.g.*, with verbs of calling, thus "call me" =ngo (not kăto) ngake; "I did not call you" =nge nô (not kăto) angake, but it is also found with verbs implying a very pronounced action, *e.g.* nge nô haitilabu - "I will kill you," but here the verb is a causative form of hai="die," and does not describe an action which passes to the object, merely meaning "cause to die."

In this respect the pronoun resembles the proper name which would take no case inflection in such circumstances, in the case of the proper name no doubt because the idea of direct speech is retained in what amounts to indirect speech.

## PRONOMINAL ADJECTIVES.

First person	kă-, or kü	=my, our
Second person	kă-	=your
Third person	hau-	=his

These may be used at any rate in the first two persons, of both singular and plural pronouns, but if it is desired to make the plural quite clear, the plural genitive of the pronoun is used. Contrariwise the singular genitive of the personal pronoun is also used to distinguish definitely the singular form. Before nouns beginning with a vowel also the genitive form of the personal pronoun is usually employed. *e.g.*

My dog=kă-kei or ngebu kei.

our dog=sănebu kei.

your bird=kăbu ao (kă'ao may also be used).

his dog=hau-kei.

his bird=hauebu ao.

their bird=hauanebu ao.

## DEMONSTRATIVE PRONOUN.

*Singular*

This=ho

That=khwo

These pronouns are usually prefixed to the noun and when emphasis is desired are suffixed as well, *e.g.*

mho-at-ho=this very man.

khwo-chama=in that house.



These pronouns are also suffixed to the noun without being prefixed, in which case the case termination follows the pronoun not the noun, *e.g.*

'I will beat the dog' = keihoto (or ho-keito) ngāmlam.

#### Plural

these = hābu

those = kābu

When used absolutely, shoung (*i.e.*, 'several,' 'group,' etc.) may be attached to hābu and kābu; when these are prefixed to a noun, ho, khwo may be suffixed to the noun, *e.g.*

"Which dogs?" "These" = laubo kei? hābu shoung.  
Those birds = kābu ao or kābu ao-kāhwo.

#### INTERROGATIVE PRONOUNS.

Who = au.

Which = lau, laubo.

What = ai.

#### INDEFINITE PRONOUNS.

Some one = auji.

Something = aiji.

Something or other = ajamjam.

#### CORRELATIVES.

How much? = lāting, lāluji. so much = hajuji, kajuji.

How? = lai so = hai, kai

Of what sort = laibu of this sort = haibu

of that sort = kaibu.

Why? = aila for this reason = hola for that reason = khwola

Where? = lato here = hato there = kato

launi

hani

kani

Whereabouts? = laini

On which side? = lān

over here = leini

over there = teini

When? = latong

now = tou

then = kejini.

#### REFLEXIVE PRONOUNS.

Self = mātṣām (lit. = man alone)

I myself = kāmātṣām Plu. sāmātṣām, kāmātṣām

thyself = kāmātṣām

kāmātṣām

himself = haumātṣām

hauanmātṣām

N.B.—lulu, = 'of own accord,' used as an enclitic may sometimes serve as a reflexive.

## RELATIVE PRONOUNS.

Like other Naga languages Chang avoids relative pronouns as far as possible. Where they are indispensable the interrogative form is used, followed ordinarily by the subjunctive form of the verb. Otherwise the verbal adjective is used to express the negative. *e.g.*

'The man who came'=*lōbu māt* (*lobu* being the adjectival form of *lō*=to come).

'The man to whom I spoke has gone'=*nge auto laukaji, khwo hauke* [lit. I whom spoke (subj.), he has gone].

The woman who lives in that house is dead=  
*khwo-chama kibu yaksa, khwo haya.*  
(lit. that-house-in remainder woman, she is dead)

Choose which you like=*lau maike, langashi.*  
(which is good, take).

## VERB.

The Chang verb is found only in the Active Voice.<sup>1</sup> But as regards mood it has besides the indicative and imperative moods, a definite Subjunctive form used in dependent clauses, and also Continuative, Causative, Desiderative and Inceptive compounds. In tense the Chang verb is prolific, there being sometimes several forms expressive of the same tense, and while sometimes all are used sometimes certain tense termination are not used with particular verbs, usually, it seems, to avoid confusion with some other word. Such conventions in use may vary from village and in any case defy tabulation and are only to be learnt by practice.

Each tense of the verb has also a negative or prohibitive form usually formed from the positive on a recognized and more or less consistent principle, but in the case of verbs beginning with a vowel or with an aspirate both the negative prefix (*a-*) and the main vowel of the root form are generally changed, and this change does not seem based on any very clear principle, though the prefix is usually *ü* or *i* instead of *ā*. (In the vocabulary at the end the irregular negative forms are given with the positive forms; regular forms being omitted.)

In conjugating any verbs the changes to which certain consonants are liable when preceded or followed by certain other should be borne in mind as they account for what are, at first sight, apparent irregularities.

<sup>1</sup> Some forms have a Quasi-passive use, *e.g.* *angako loake*='uncalled he came,' but the participle here should probably be really regarded as an absolute use of the Active and='no (one) having called.' The verbal adjective, however, seems often to approach a genuine Passive.

The Imperative, besides the usual form, has in many verbs a reflexive form used only, and always, when the speaker himself is to be the object of the action ordered. In the case also of certain familiar verbs there is what may be called an Imperative of Propinquity taken from quite a different root, used only in that particular form and employed when the speaker is giving a curt order or direction which relates to the immediate presence of the speaker only. Such imperatives are found for the orders "Go!" "Come (here)!" "Give (it to me!)" and similar familiar commands. It may perhaps be surmised that these forms are survivals of some other language which has otherwise disappeared or been absorbed in the prevailing language of the tribe.

The following are moods, tenses and forms of the Chang verb in so far as they can be classified. Then terms should not, of course, be construed in the precise sense which they might bear in the case of a classical language.

#### 1. THE INFINITIVE.

2. IMPERATIVE { **Imperative Direct** (with its negative form the Prohibitive).  
**Imperative Reflexive** where the action order reflects back on the speaker.  
**Permissive.**

#### Present.

**Preterite** expressing an action completed in past time, *e.g.* English "did."

**Perfect** expressing an action performed in the past, the results of which continue into the present, *e.g.*, English "has done."

3. INDICATIVE { *N.B.*—In verbs denoting the existence of a quality the force of this tense is little more than that of a simple present. Such verbs are usually more or less defective and are little used in other tenses—*e.g.* *maikē* (perfect form)="is good."

#### Future.

**Potential** expressing ability (or inability) to perform an action.

4. PARTICIPIAL { **Present** indicating the state during which an action takes place.  
**Past** indicating the completion of an action on which further action follows.  
**Adjectival** denoting the condition of doing or of being done.  
**Gerund** denoting finality or purpose.<sup>1</sup>  
**Gerundive** denoting fitness for action.

<sup>1</sup> It is simply the verbal root with the postposition -la suffixed.

5. **SUBJUNCTIVE**—a form used to modify the indicative tenses in dependant clauses.
6. **CONTINUATIVE**—a form used to express emphatic continuation of the action.
7. **CAUSATIVE**—a form used to turn intransitive verbs into transitive and to express generally causation, or even mere permission.
8. **DESIDERATIVE**—expressing the wish to act.
9. **INCEPTIVE**—expressing the beginning of action.

The following are the mood tense and form inflexions of the Chang verb :—

	Positive	Negative
<b>IMPERATIVE</b>	Direct	
	-ashi (or 'shi)	ta-
	-ash	
	Reflexive	
	-pu	ta- -pu
	-ke	ta-
<b>INDICATIVE</b>	Permissive	
	na- -a	ta- -ti
	Present	
	-ta	a- -ta
	Preterite	
	-a	a-
	Perfect	
	-kē	a- -kē
	-akē	
	Future	
<b>PARTICIPIAL</b>	-labu (or -lab')	a- -labu (or lab')
	-lam	a- -lam
	-ko	ta- -ko
	Potential	
	-anlam	a- -anlam
	-anlabu	a- -anlabu
<b>PARTICIPIAL</b>	Present	
	-jini	a- -jini
	-toā	a- -toā
	Past	
	-an, -anyu chung	a- -ko

*N.B.*—*ji* alone implies mere subjugation of the clause, *-si* is used where a condition is expressed (*vide* examples below).

CONTINUATIVE

*N.B.*—The root form with -*üŋ* is followed by a repetition of the verb in whatever tense is applicable to the situation. *e.g.* *kām*='do'—*kāmüŋ kām̐ta*='continues to do'; *shau*='eat' > *shauüŋ shauke*='continued eating.'

## CAUSATIVE

*N.B.*—*-ti-* is infixed immediately after the root and before the inflexion. In the imperative the *i* is usually dropped, *e.g.* *shauashi* = 'eat' *shau-t'ashi* (not *shauti'ashi*) = 'feed.' This

infix is also sometimes used with a purely continuative sense, as well as being frequently merely permissive.

## DESIDERATIVE

-māng sūgh-

-māng asūgh-

*N.B.*—*māng* is suffixed to the root and this compound followed by the root *sūgh* conjugated in the ordinary way, the use of the nominative or agentive case of the subject being determined by the verb signifying the action desired and not by the verb *sūgh* signifying the desire; thus while "I wish to go" (*hau*)=*ngo haumāng sūgh*ta, "I wish to do" (*kām*)=*ngei kām māng sūgh*ta.

## INCEPTIVE

-la nyǎng

-la anyǎng

*N.B.*—The gerund of the verb is followed by *nyǎng* conjugated on the ordinary way.

## REPRESENTATIVE VERBS.

The following common verbs are conjugated by way of illustrating the Chang verb, which though regular on the whole is capricious at times, indulging in vagaries on no very fixed plan, many verbs being defective in parts and having other unreasonable idiosyncracies. The verbs given are fairly representative.

They are :—

- |   |  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
|---|--|-----------------|------|-------|-------|------|----------|------|-------|-------|------|-------|---------|------|------|---------|--------|------|----------|---------|---------|
| <p>A. verbs with stems beginning with a consonant and ending with a simple vowel.</p> <p><i>N.B.</i>—When this vowel is -a, the initial a of the inflection is not repeated</p>   | <div style="display: inline-block; vertical-align: middle; font-size: 4em; line-height: 1;">{</div> <table border="0" style="display: inline-table; vertical-align: middle;"> <tr><td>ki-</td><td>be</td></tr> <tr><td>phe-</td><td>ask</td></tr> <tr><td>ku-</td><td>give</td></tr> <tr><td>lē-</td><td>take</td></tr> <tr><td>lō-</td><td>come</td></tr> <tr><td>shi-</td><td>hunt</td></tr> <tr><td>ngā-</td><td>call</td></tr> <tr><td>songba-</td><td>bring</td></tr> </table>  | ki-             | be   | phe-  | ask   | ku-  | give     | lē-  | take  | lō-   | come | shi-  | hunt    | ngā- | call | songba- | bring  |      |          |         |         |
| ki-   | be   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| phe-  | ask  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| ku-   | give   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| lē-   | take   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| lō-   | come   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| shi-  | hunt   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| ngā-  | call   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| songba-   | bring  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| <p>B. ditto, ending with a diphthong,</p>   | <div style="display: inline-block; vertical-align: middle; font-size: 4em; line-height: 1;">{</div> <table border="0" style="display: inline-table; vertical-align: middle;"> <tr><td colspan="2">chongei- answer</td></tr> <tr><td>lau-</td><td>speak</td></tr> </table>  | chongei- answer |      | lau-  | speak |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| chongei- answer   |  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| lau-  | speak  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| <p>C. ditto, ending with a consonant</p> <p><i>N.B.</i>—The final consonant of the stem or the initial consonant of the inflection is often altered (<i>v.</i> page 9) under the influence of the consonant following or preceding it as the case may be.</p> | <div style="display: inline-block; vertical-align: middle; font-size: 4em; line-height: 1;">{</div> <table border="0" style="display: inline-table; vertical-align: middle;"> <tr><td>lěn-</td><td>tell</td></tr> <tr><td>yung-</td><td>drink</td></tr> <tr><td>sāt-</td><td>run away</td></tr> <tr><td>kok-</td><td>steal</td></tr> <tr><td>cheg-</td><td>buy</td></tr> <tr><td>chüg-</td><td>look at</td></tr> <tr><td>kām-</td><td>do</td></tr> <tr><td>ngām-</td><td>strike</td></tr> <tr><td>yeb-</td><td>lie down</td></tr> <tr><td>lāksāb-</td><td>rise up</td></tr> </table> | lěn-            | tell | yung- | drink | sāt- | run away | kok- | steal | cheg- | buy  | chüg- | look at | kām- | do   | ngām-   | strike | yeb- | lie down | lāksāb- | rise up |
| lěn-  | tell   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| yung-   | drink  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| sāt-  | run away   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| kok-  | steal  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| cheg-   | buy  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| chüg-   | look at  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| kām-  | do   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| ngām-   | strike   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| yeb-  | lie down   |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |
| lāksāb-   | rise up  |                 |      |       |       |      |          |      |       |       |      |       |         |      |      |         |        |      |          |         |         |



- D. verbs with stems beginning with a vowel or H.
- N.B.—Here there is a vowel change in the negative form, a becomes ü, ai becomes ei, au becomes o.
- |  |        |                 |
|--|--------|-----------------|
|  | ang-   | go up           |
|  | in-    | give to drink   |
|  | öknin- | feed, entertain |
|  | hăp-   | get             |
|  | hai-   | die             |
|  | hau-   | go              |

Ki=be, stay.

Positive.

Negative.

ki	to be, stay	aki	not to be, not to stay.	INTIN.
kiashi,	} be, stay	taki	be not, stay not	IMP. Direct.
kiash				
ki' shi				
kipu		yakipu		„ Reflex.
nakia	let be, stay	takiti	let not be.	„ Permis-
			stay	sive
kita	is staying	akita	is not staying	INDIC. Present
kia	is	aki	is not	„ Pret.
kikē	stayed	akikē	did not stay	„ Perfect
kilabu,	} will be,	akilabu	} will not be,	„ Future
kilab'		etc.		
kilam		takiko		
kiko	stay			
kianlabu	} can be,	akianlabu	} cannot be,	„ Poten-
kianlam		etc.		
kijini	} while being,	akijini	} while not being,	PARTICIPLE
kitoā		akitoā		
kian,	} having	akiko	} not staying.	Present
kianyu				
kila	been, stayed		not having been,	„ Past
	for staying		stayed.	
....		....		„ Gerund
				„ Gerun-
				dive
kibu	was	akibu	was not.	Adjectival.

The verb *ying* is often used where in English we use the verb 'to be': Its full sense is 'to be right' 'correct' thus *aying*= 'no,' 'not so.'

The aorist *kia* is the ordinary word for "is" and is used ordinarily for present time though it may also be used in speaking of the past as we use the historic present in English or in French. There is no perfect tense in the sense of 'has been.' The adjectival *kibu* is always used for 'was' though it also has its adjectival meaning of 'one who is' or 'stays,' with particular reference to one who stays in the house instead of going about to work or hunt, etc.

The form *kichan* is not used; "meet to be" or "meet to stay" is expressed by saying *kila chankē*, i.e. "is suitable for being" < the verb *chan*= 'befit,' (negative—*kila achankē*).

## Phe=ask. VERB.

Positive.		Negative.		
phe	to ask	aphe	not to ask	INFINITIVE.
pheashi, } pheash }	ask	taphe	ask not	Direct IMP.
pheke	ask (me)	taphe	ask (me) not	Reflex. „
naphea	let—ask	tapheti	let— not ask	Permissive
pheta	is asking	apheta	is not asking	Present INDI.
phea	asked	aphe	did not ask	Pret. „
pheakē } phekē }	has asked	aphekē	has not asked	Perfect „
phelabu } phelab' }	will ask	aphelabu } etc. }	will not ask	Future „
phelam }		tapheko }		
pheko }		apheanlabu }	cannot ask	Potential „
pheanlabu }	can ask	etc. }		
pheanlan }		aphejini }	while not	PARTICIPLE
phejini }	while	aphejini }	asking	Present
phetoā }	asking	apheko }	not having asked	„ Past
phean <sup>1</sup> }	having			
phechung }	asked			
phela	for asking			„ Gerund
phechan	meet to ask, be asked	aphechan	not meet to ask be asked	„ Gerund- dive
phebu	which is ask- ed or asks	aphebu	one who does not ask or is notasked	Adjectival

## Ku=Give. VERB.

Positive		Negative	
ku	to give	aku	INFINITIVE
kuashi, etc.	give	toku	Direct IMPERATIVE
lapu <sup>2</sup>		talapu	Reflex. „
nakua	let—give	tokuti <sup>3</sup>	Permissive „
kuta	is giving	akuta	Present INDICATIVE
kua	gave	aku	Participle „
kuakē, etc.	has given	akuke	Perfect „

<sup>1</sup> also **pheanyu**. This form may be taken as in use in all verbs when ever the form in -an simply is in use.

<sup>2</sup> Reflexive Imperative—**lapu**, from a different root, as often.

Negative—**talapu**.

<sup>3</sup> **tokuti** also=“don't send,” imperative direct (Negative) from **kuti**=‘send’ (causative of **ku**).

Positive		Negative	
kulabu, etc.	} will give	akulabu, etc.	Future INDICATIVE
kuko		takuko	
kuanlabu, etc.	can give	akuanlabu, etc.	Potential „
kujini	} in giving,	akujini	Present PARTICIPLE
kutoā		akutoā	
kuan	while giving	akuko	Past „
kuchung	having given		
kula	for giving		Gerund „
kuchan	meet to give (or be given)	akuchan	Gerundive „
kubu	which is given or gives	akubu	Adjectival „

Lē=Take.<sup>1</sup> VERB.

Positive		Negative	
le	to take	ale	INFINITIVE
leashi, etc.	take	tale	Direct IMPERATIVE
....		....	Reflexive „
nalea	let take	taleti	Permissive „
leta	is taking	aleta	Present INDICATIVE
lea	took	ale	Preterite „
leakē, etc.	has taken	alekē	Perfect „
lelabu, etc.	} will take	alelabu, etc.	Future „
leko		taleko	
leanlabu, etc.	can take	aleanlabu, etc.	Potential „
lejini	} while taking	alejini,	Present PARTICIPLES
aletoā		alctoā	
.... <sup>2</sup>		aleko=not having taken	Past „
lela	for taking		Gerund „
lechan	meet to take (or be taken)	alechan	Gerundive „
lebu	one who (or which) is taken or takes	alebu	Adjectival „

<sup>1</sup> 'take away'=lang.<sup>2</sup> lean and lechung only exist as parts of the verb le='to wear' and would only be understood in that sense. The past participle 'having taken' must be rendered by langan, chungan or chungchung from lang='take away' and chung='take hold.'

## lō = Come. VERB.

Positive		Negative	
lo	to come	alo	INFINITIVE
ka, kai <sup>1</sup>	come	tikai	Direct IMPERATIVE
naloa	let come	taloti	Permissive „
lota	is coming	alota	Present INDICATIVE
loa	came	alo	Preterite „
loakē, etc.	has come	alokē	Perfect „
loanlabu, } etc.	will come	alolabu,	Future „
loko		etc.	
loanlabu, } etc.	can come	taloko	
lojini, etc.	while coming	aloanlabu,	Potential „
loän <sup>2</sup> } .... <sup>2</sup>	having come	etc.	
lola	for coming	alojini, etc.	Present PARTICIPLES
lochan	meet to come	aloko	Past „
lobu	comer, one who comes, or came.	alochan	Gerund „
		alobu	Gerundive „
			Adjectival „

## Shī = hunt, drive. VERB.

Positive		Negative	
shi	to hunt	ashi	INFINITIVE
shiyashi, } etc.	hunt	tashi	Direct „
(shian chimbu)		tashi	Reflexive „
nashia	let hunt	tashiti	Permissive „
shita	is hunting	ashita	Present INDICATIVE
shia	hunted	ashi	Preterite „
shiake, etc.	has hunted	ashike	Perfect „
shilabu, } etc.	will hunt	ashilabu,	Future „
shiko		etc.	
shianlabu } etc.	can hunt	tashiko	
shijini, etc.	while hunting	ashianlabu,	Potential „
		etc.	
shian } shichung } shila	having hunted	ashijini	Present PARTICIPLES
	for hunting	etc.	
		ashiko	Past „
			Gerund „

<sup>1</sup> Imperative of Propinquity from different root, used only with immediate reference to speaker, and only in immediate present both of time and place.

<sup>2</sup> lochung not in ordinary use.

Positive		Negative	
shichan	meet to hunt (or be hunted)	ashichan	Gerundive PARTICI- PLES
shibu	one who hunts (or is hunted)	ashibu.	Adjectival "

## ngā=to call. VERB.

Positive		Negative	
nga	to call	anga	INFINITIVE
ngashi, etc.	call	tanga	Direct IMPERATIVE
ngake	call (me)	tanga	Reflexive "
nanga	let call	tangati	Permissive "
ngata	is calling	angata	Present INDICATIVE
nga	called	anga	Preterite "
ngakē	has called	angakē	Perfect "
ngalabu, } etc.	will call	anganlabu, } etc.	Future "
ngako		tangako	
nganlabu, } etc.	can call	anganlabu	Potential "
ngajini	while calling	angajini	Present PARTICIPLES
ngan } ngachung }	having called	angako	Past "
ngala	for calling		Gerund "
ngachan	meet to call (or be called)	angachan	Gerundive "
ngabu	one who is called or calls	angabu.	Adjectival "

## Songba=bring. VERB.

Positive		Negative	
songba	to bring	asongba	INFINITIVE
songba' }	bring	tasongba	Direct "
songbashi }			
nasongba	let bring	tasongbati	Permissive "
songbata	is bringing	asongbata	Present INDICATIVE
....		asongba did not bring	Preterite "
songbake	brought	asongbake has not brought	Perfect "
songbalabu, } etc.	will bring	asongbalabu, etc.	Future "
songbako		asongbako	
songbanlabu } etc.	can bring	asongbanlabu, etc.	Potential "

Positive		Negative	
songbajini	while bring-	asongbajini	Present PARTICIPLES
etc.	ing	etc.	
songban	having	asongbako	Past       ,,
	brought		
songbala	for bring-	....	Gerund       ,,
	ing		
sonbachan	meet to bring	asongbachan	Gerundive       ,,
	(or be brought)		
songbabu	who is brought	asongbabu.	Adjectival       ,,
	(or brings.)		

## Chongei = answer. VERB.

Positive	Negative	
chongei	achongei	INFINITIVE
chongeiashi, }	tachonei	Direct IMPERATIVE
chongeishi }		
chongeike,	tachongei	Reflexive       ,,
chongeipuh }		
nachongeia }	tachongeiti	Permissive       ,,
chongeita	achongeita	Present INDICATIVE
chongeia	achonge	Preterite       ,,
chongeyake, etc.	achongeike	Perfect       ,,
chongeilabu, etc. }	achongeilabu, etc.	Future       ,,
chongeiko }	tachongeiko	
chongeyanlabu,	achongeyanlabu,	Potential       ,,
etc.	etc.	
chongeijini, etc.	achongeijini, etc.	Present PARTICIPLES
chongeian	achongeiko	Past       ,,
chongeila		Gerund       ,,
chongeichan	achongeichan	Gerundive       ,,
chongeibu	achongeibu	Adjectival       ,,

chongei is also commonly found in the causative form chongeiti—with the same sense as the simple form, so that whereas haula tachongeiti = 'let him not answer,' tachongeiti simply = 'don't answer.'

## lau = Say, speak. VERB.

Positive	Negative	
lau	alau	INFINITIVE
lauashi, la'ashi, etc.	talau	Direct IMPERATIVE
.....		Reflexive       ,,
nalaua	talauti	Permissive       ,,
lauta	alauta	Present INDICATIVE
laua	alau	Preterite       ,,
lauake	alauke	Perfect       ,,

Positive	Negative	
laulabu, etc. }	alaulabu, etc.	Future INDICATIVE
lauko }	talauko	
lauanlabu, etc.	alauanlabu, etc.	Potential „
laujini, etc.	alaujini, etc.	Present PARTICIPLES
lauan }		
lauchung }	alauko	Past „
laula		Gerund „
lauchan	alauchan	Gerundive „
laubu	alauabu	Adjectival „

Compare the verb *len* following. The reflexive imperative of that verb is in very common use.

In *shau* = 'eat,' the participle is contracted to *shān*.

*len* = tell, explain. VERB.

Positive	Negative	
<i>len</i>	<i>alen</i>	INFINITIVE
<i>lenashi</i> , etc.	<i>talen</i>	Direct IMPERATIVE
<i>lemphu</i>	<i>talempu</i>	Reflexive „
<i>nalena</i>	....	Permissive „
<i>lenta</i>	<i>alenta</i>	Present INDICATIVE
<i>lena</i>	<i>alen</i>	Preterite „
<i>lenake</i> , etc.	<i>alenske</i> , etc.	Perfect „
<i>lenlabu</i> , etc. }	<i>alենlabu</i> , etc.	Future „
<i>lenko</i> }	<i>talenko</i>	
<i>lenanlabu</i> , etc.	<i>alենanlabu</i> , etc.	Potential „
<i>lenjini</i> , etc.	<i>alենjini</i> , etc.	Present PARTICIPLES
<i>lenan</i> }	<i>alenko</i>	Past „
<i>lenchung</i> }		
<i>lenla</i>		Gerund „
<i>lenchan</i>	<i>alենchan</i>	Gerundive „
....	....	Adjectival „

No adjectival form in use. See verb *lau* = 'speak,' 'say' on previous page. These two verbs sometimes supplement one another in defective parts.

*talenti* seems only to be used as direct prohibitive of causative from *lenti* = 'cause to tell,' 'report.'

*Yung* = drink. VERB.

Positive	Negative	
<i>yung</i>	<i>ayung</i>	INFINITIVE
<i>yungashi</i> , etc.	<i>teyung</i>	Direct IMPERATIVE
<i>nayunga</i>	<i>teyungti</i>	Permissive „
<i>yungta</i>	<i>ayungta</i>	Present INDICATIVE
<i>yunga</i>	<i>ayung</i>	Preterite „



Positive	Negative	
yungake, etc.	ayungke	Perfect INDICATIVE
yunglabu, etc. }	ayunglabu, etc.	Future „
yungko }	teyungko	
yunganlabu, etc.	ayunganlabu, etc.	Potential „
yungjini, etc.	ayungjini, etc.	Present PARTICIPLES
yungan }		
yungchung }	ayungko	Past „
yungla }		
yungchan	ayungchan	Gerund „
yungbu	ayungbu	Gerundive „
		Adjectival „

See also verb in=to give to drink.

Sāt=run away. VERB.

Positive	Negative	
sāt	asat	INFINITIVE
sātashi, etc.	tasat	Direct IMPERATIVE
....	....	Reflexive „
nasāta	tasatti	Permissive „
sātta	asatṭa	Present INDICATIVE
sāta	asat	Preterite „
sātake, etc.	asatke or asakke	Perfect „
sātlabu, etc. }	asatlabu, etc.	Future „
sātko }	tasatko or tasakko	
sātanlabu, etc.	asatanlabu, etc.	Potential „
sātjini, etc.	asatjini, etc.	Present PARTICIPLES
sātan	asatko or asakko	Past „
sātla		Gerund „
sātchan	asatchan	Gerundive „
sātbu	asatbu	Adjectival „

‘run’, simply.=lāng

sāt=‘sit down’ is conjugated like sāt, but has the form sātchung as well as sātan. The perfect sātake=‘has sat down’ i.e. “is sitting.”

Kok=steal. VERB.

Positive	Negative	
kok	akok	INFINITIVE
kokashi, etc.	takok	Direct IMPERATIVE
kokpu	takokpu	Reflexive „
nakoka	takokti	Permissive „
kokta	akokta	Present INDICATIVE
koka	akok	Preterite „
kokake, etc.	akokke	Perfect „

Positive	Negative	
koklabu, etc. }	akoklabu, etc.	Future INDICATIVE
kokko }	takokko	
kokanlabu, etc.	akokanlabu	Potential "
kokjini, etc.	akokjini, etc.	Present PARTICIPLES
kokan }		
kokchung }	akokko	Past "
kokla		Gerund "
kokchan	akokchan	Gerundive "
kokpu	akokpu	Adjectival "

N.B.—Yak. = "sell" is precisely similar.

Cheg. = buy. VERB.

Positive	Negative		
cheg	acheg		INFINITIVE
chegashi, etc.	tacheg	Direct	IMPERATIVE
chegpu *	tachegpu	Reflexive	"
nachega	tachegti	Permissive	"
chegta	achegta	Present	INDICATIVE
chega	acheg	Preterite	"
chegake, etc.	achegke	Perfect	"
cheglabu, etc. }	acheglabu, etc.	Future	"
chegko }	tachegko		
cheganlabu, etc.	acheganlabu	Potential	"
chegjini	achegjini	Present	PARTICIPLES.
chegan }	achegko	Past	"
chegchung }			
chegla		Gerund	"
chekchan	achekchan	Gerundive	"
chegbu	achegbu	Adjectival	"

\* N.B.—chüg. —look at, examine, is similar, except in that it makes the Imperative Reflexive chügke, negative tachüg.

kām. = do. VERB.

Positive	Negative		
kām	akām		INFINITIVE
kāmashi, etc.	takām	Direct	IMPERATIVE
(kampu)*		Reflexive	"
nakāma	takāmti	Permissive	"
kāmta	akāmta	Present	INDICATIVE
kāma	akām	Preterite	"
kāmake, kāmpe	akāmpe	Perfect	"
kāmlabu, etc. }	akāmlabu, etc.	Future	"
kāmpo }	tākāmpo		
kāmanlabu, etc.	akāmanlabu, etc.	Potential	"

Positive	Negative		
kāmjini	akāmjini	Present	PARTICIPLES
kāman	akāmpo	Past	"
kāmchung }		Gerund	"
kāmīa	akāmchan	Gerundive	"
kāmchan		Adjectival	"
kāmbu			

\* in *sens. obsc.* only.

ngām- = 'strike' is precisely similar, except that it has for its Imperative Reflexive ngampe, negative tangam.

All verbs with roots ending in *m* undergo the same changes from *k* to *p* in their inflections as kām- and ngām-.

Yeb=lie down, sleep. VERB.

Positive	Negative		
yeb	ayeb		INFINITIVE
yebashi, etc.	tayeb	Direct	IMPERATIVE
nayeba	tayepti	Permissive	"
yepta	ayepta	Present	INDICATIVE
yeba	ayeb	Preterite	"
yebake, yeppe	ayeppe	Perfect	"
yebīabu, etc. }	ayebīabu, etc.	Future	"
yeppo	tayeppo		
yebanīabu, etc.	ayebanīabu, etc.	Potential	"
yeppjini, etc.	ayepjini, etc.	Present	PARTICIPLES
yeban	ayeppo	Past	"
yebchung }		Gerund	"
yebīa	ayebchan	Gerundive	"
yebchan		Adjectival	"
yebbu			

N.B.—Other verbs with stems ending in *b* undergo the same consonantal changes as yeb-; verbs with stems ending in *p* are also similar.

Lāksāb=rise. VERB.

Positive	Negative		
lāksāb	alaksab		INFINITIVE
lāksābashi, etc.	talaksab	Direct	IMPERATIVE
nalaksaba	talaksapti	Permissive	"
laksapta	alaksabta	Present	INDICATIVE
laksaba	alaksab	Preterite	"
laksabake, laksappe	alaksappe	Perfect	"
laksabīabu, etc. }	alaksabīabu, etc.	Future	"
laksappo	talaksappo		
laksabanīabu, etc.	alaksabanīabu, etc. }	Potential	"

laksabjini	alaksabjini	Present	PARTICIPLES
laksaptoā	alaksaptoā		"
laksaban	alaksappo	Past	"
laksabchung		Gerund	"
laksabla	alaksabchan	Gerundive	"
laksabchan	alaksabbu	Adjectival	"
laksabbu			"

*N.B.*—Other verbs with roots ending in **b** are conjugated like *lāksāb*.

*lāksāb* = to rise from a recumbent posture. To rise from a sitting posture is *lu*.

*Ang* = go up. VERB.

Positive	Negative		
<i>ang</i>	<i>ü'ang</i>		INFINITIVE
<i>angashi</i> , etc.	<i>teang</i>	Direct	IMPERATIVE
<i>nanga</i>	<i>teangti</i>	Permissive	"
<i>angta</i>	<i>ü'angta</i>	Present	INDICATIVE
<i>anga</i>	<i>ü'ang</i>	Preterite	"
<i>angake</i> , etc.	<i>ü'angke</i>	Perfect	"
<i>anglabu</i> , etc.	<i>ü'anglabu</i> , etc.	Future	"
<i>angko</i>	<i>teangko</i>		
<i>anganlabu</i> , etc.	<i>ü'anganlabu</i> , etc.	Potential	"
<i>angjini</i> , etc.	<i>ü'angjini</i> , etc.	Present	PARTICIPLES
<i>angan</i>	<i>ü'angko</i>	Past	"
<i>angla</i>		Gerund	"
<i>angchan</i>	<i>ü'angchan</i>	Gerundive	"
<i>angbu</i>	<i>ü'angbu</i>	Adjectival	"

*N.B.*—Similar are other verbs with roots beginning with **a**—

*in* = give to drink. VERB.

Positive	Negative		
<i>in</i>	<i>iin</i>		INFINITIVE
<i>inashi</i> , etc.	<i>tein</i>	Direct	IMPERATIVE
<i>impu</i>	<i>teimpuh</i>	Reflexive	"
<i>naına</i>	<i>teinti</i>	Permissive	"
<i>inta</i>	<i>iinta</i>	Present	INDICATIVE
<i>ina</i>	<i>iin</i>	Preterite	"
<i>inake</i> , etc.	<i>iinke</i>	Perfect	"
<i>inlabu</i> , etc.	<i>iinalabu</i> , etc.		
<i>inko</i>	<i>teinko</i>	Future	"
<i>inanlabuh</i> , etc.	<i>iinanlabu</i> , etc.	Potential	"
<i>injini</i>	<i>iinjini</i>	Present	PARTICIPLES
<i>inan</i>	<i>iinko</i>	Past	"
<i>inla</i>		Gerund	"
<i>inchan</i>	<i>iinchan</i>	Gerundive	"
<i>imbu</i>	<i>iimbu</i>	Adjectival	"

*N.B.*—When used with the noun *i* (= 'liquor') as its object, much confusion is liable to arise between *i in* = "to give liquor to drink" and *iin* = "not to give to drink."

*Öknin* = feed, entertain. VERB.

Positive	Negative		
<i>öknin</i>	<i>öknin</i>		INFINITIVE
<i>ökninashi</i>	<i>töknin</i>	Direct	IMPERATIVE
<i>nöknina</i>	<i>tökninti</i>	Permissive	"
<i>ökninta</i>	<i>ökninta</i>	Present	INDICATIVE
<i>öknina</i>	<i>öknin</i>	Preterite	"
<i>ökninake</i>	<i>ökninke</i>	Perfect	"
<i>ökninlabu</i>	<i>ökninlabu</i>	Future	"
<i>ökninko</i>	<i>tökninko</i>		
<i>ökninanlabu</i>	<i>ökninanlabu</i>	Potential	"
<i>ökninjini</i>	<i>ökninjini</i>	Present	PARTICIPLES
<i>ökninan</i>	<i>ökninko</i>	Past	"
<i>ökninla</i>		Gerund	"
<i>ökninchan</i>	<i>ökninchan</i>	Gerundive	"
<i>ökninbu</i>	<i>ökninbu</i>	Adjectival	"

*N.B.*—The difference between the negative and positive is comparatively clear in this case, but in some verbs beginning with *o* the two are almost indistinguishable to any one but a Chang himself, as in the verb *oyu* = 'quarrel.' The positive and negative may be distinguished in writing by long and short marks, *öyu*- and *oyu*-, but in pronunciation I have found the difference almost incapable of discrimination.

*Häp* = get, meet, see. VERB.

Positive	Negative		
<i>háp</i>	<i>ühüp</i> or <i>ihíp</i>		INFINITIVE
<i>hápashi</i> , etc.	<i>tühüp</i> or <i>tihíp</i>	Direct	IMPERATIVE
<i>nahäpa</i>	<i>tühüpti</i> or <i>tihípti</i>	Permissive	"
<i>hápta</i>	<i>ühüpta</i> , etc.	Present	INDICATIVE
<i>häpa</i>	<i>ühüp</i>	Preterite	"
<i>hápake</i> , <i>happe</i>	<i>ühüppe</i>	Perfect	"
<i>háp labu</i> , etc. }	<i>ühüplabu</i> , etc.	Future	"
<i>háp po</i>	<i>tühüppo</i>		
<i>háp anlabu</i> , etc.	<i>ühüpanlabu</i> , etc.	Potential	"
<i>hápjini</i> , etc.	<i>ühüpjini</i> , etc.	Present	PARTICIPLES
<i>háp an</i>			
<i>háp chung</i> }	<i>ühüppo</i>	Past	"
<i>háp la</i>		Gerund	"
<i>háp chan</i>	<i>ühüpchan</i>	Gerundive	"
<i>háp pu</i>	<i>ühüppu</i>	Adjectival	"

*N.B.*—Apart from the consonantal changes consequent on the stems ending in **p**, other verbs beginning with **ha-** form their negative similarly.

**hai- = die. VERB.**

Positive	Negative		
hai	ühei or ihei		INFINITIVE
haiashi, etc.	tühei, tihei	Direct	IMPERATIVE
nahaia	tüheiti, etc. <sup>1</sup>	Permissive	..
haita	üheita	Present	INDICATIVE
haia	ühei	Preterite	..
haiake, etc.	üheike	Perfect	..
hailabu, etc. }	üheilabu, etc.	Future	..
haiko	tüheiko		
hayanlabu, etc.	üheianlabu, etc.	Potential	..
haijini, etc.	üheijini, etc.	Present	PARTICIPLES
haian	üheiko	Past	..
haila		Gerund	..
haichan	üheichan	Gerundive	..
haibu	üheibu	Adjectival	..

**hau=go. VERB.**

Positive	Negative		
hau	ohō		INFINITIVE
hauashi, etc.	tohō	Direct	IMPERATIVE
(ko <sup>2</sup> )		Reflexive	..
nahaua	tohōti	Permissive	..
hauta	ohōta	Present	INDICATIVE
haua	ohō	Preterite	..
hauake, etc.	ohōke	Perfect	..
haulabu, etc. }	ohōlabu, etc.	Future	..
hauko	tohōko		
hauanlabu, etc.	ohoänlabu, etc.	Potential	..
haujini, etc.	ohōjini, etc.	Present	PARTICIPLES
hauan	ohōko	Past	..
haua		Gerund	..
hauchan	ohōchan	Gerundive	..
haubu	ohobu	Adjectival	..

*N.B.*—**hau**=‘to hit’ (a mark) and **hau**=‘to gather up’ both make their negative **uhau**.

<sup>1</sup> The alternative negative root in **ihei** gives formations for each tense just like the form **ühei**.

<sup>2</sup> **ko** from another root=“go!,” “get out!” and is used with reference to immediate departure from the immediate presence of the speaker, under which circumstances **hauashi** would not be used.

hau—go *high tone.*  
 hau—hit *low tone.*  
 hau—gather *medium tone.*

### EXAMPLES OF THE USE OF VERBS.

#### IMPERATIVE.

Come here ! = ka !  
 Come tomorrow = nyet kai.  
 Give him two rupees = haula nām pan-ni kuashi.  
 Give me rohi=kāla nyāgi-tei lapu.  
 Ask Ngaku = Ngakuka pheashi.  
 Ask me = kato pheke.  
 Call Yanchu = Yanchu (or Yanchu-to) ngāshi.  
 Call me = kato (or ngo) ngāke.  
 Don't give me modhu to drink, give it to Ngaku = Kāla i  
 teĩmpu, Ngaku-la inashi.  
 Let him die = hau nahaia.  
 Don't let him go = hau tohoti.

#### INDICATIVE PRESENT.

The coolies are telling Yanchu that 4 annas is not right =  
 ung-kan-ik Yanchuto lauta chipe (or 'iki') tiktie ayingke.

N.B.—Here lauta may with equal correctness be placed  
 last after ayingke.

Ayingke is the perfect form, negative, of ying- = 'be  
 right,' 'correct,' as in the case of verbs expressing a quality it  
 has a merely present sense, e.g., maike="is good," chanke  
 ="is fit."

#### PRETERITE.

I asked the sahib for money; he said there was none =  
 nge shahibka nām hia; haue aki lauke.

N.B.—Here the third verb would normally be put in the  
 perfect as its statement is regarded as still holding good at the  
 moment of speaking. The second verb is in the preterite form,  
 but the sense is present (v. conjugation of ki-) as the speaker's  
 actual words are retained.

The sahib gave me money, but it was not enough, therefore  
 I stole=Shahibe kāla nām kua, lan apan, khwo-shanga  
 kōka.

#### PERFECT.

The sahib has given me money, but it is not enough. There-  
 fore I have stolen=Shahibe kāla nām kuake, lan apanke,  
 khwo-shanga kokke.

N.B.—Here the inference from kuake is that the money  
 has quite recently been given to the speaker and is still in his



possession, *apanke* is the perfect form with present sense found in verbs implying the existence of a quality, *kokke*, like *kuke*, suggests the continuance of the effect of the action up to the time of speaking.

Menya has told a lie = *Menya āmlāng lauке* (or *yepeke*).

Sibung has beaten Menya's dog = *Sibung-e Menyabu keito ngampe*.

The work is very difficult = *Kāmsilei aibu siekke*.

*N.B.*—This is another instance of the perfect with present sense found in verbs which imply the existence of a quality and not the performance of an action.

#### FUTURE.

I will not strike you = *nge kato tangampo*.

I shall kill you = *nge no haitilabu* (or *haitilam*).

*N.B.*—The object is put in the nominative form with *haiti*-, which is the causative form of the intransitive *hai*-. It may also be put in the accusative in other cases, but a Chang would not say *kato haitilam*.

It is said that he will die = *hau hailabu-tūgh*, or *hailap-tūgh* not *hailam-tūgh*.<sup>1</sup>

#### POTENTIAL.

"Can you show me the road or not?" "I can show it."  
= "*kāla lam lenan-asao?*" "*Lenan-lam*."

One can buy two fowls for a rupee = *Nām chie aunok pan-ni cheganlam*.

#### PARTICIPLE PRESENT.

"While I am speaking remain quiet" = *nge ngūgh lau-jini, sammeli ki'shi*.

While walking on the path, I met a tiger = *ngo lama paijini, saonyu happe*.

(*N.B.*—The subject takes the nominative or agentive form as the case may be as though the participle were a finite tense.)

#### PAST.

After seeing the tiger, I came back = *Saonyu häpan long-aike*.

When I have eaten rice, I will come = *Nyāk shā'n, loko*.

He went away without eating = *Ashauko hauke*.

I don't know your name, but I recognize your face = *Kā-nyen anyeko, pā kābu tesinyek shenake*.

After drinking he died = *Yungchung haia*.

<sup>1</sup> *N.B.*—The enclitic *-tūgh*, (like *-she* in Angami), means 'it is said,' and is used as an enclitic to the actual words reported.

## GERUND.

I have come to buy salt=Chăm chekla loke.

## GERUNDIVE.

Your salt (is) not fit to eat=Kābuh chăm ashauchan.

You are not fit to eat salt=Nô chăm ashauchan.

This tiger is meet to be hunted=Saunyu khwo shichan

kia.

You ought to hunt this tiger=Nô saunyu khwo shichan

kia.

## ADJECTIVAL.

The money asked for by him I gave=Haue hibu nām,  
nge kua.

(N.B.—The agentive case is used with this form of the verb.)

The man who asked, I drove away=Hibu măt, nge shian  
sättia.

The dead become ghosts=Măt haibu-shoung soula  
yeia.

(N.B.—Here the adjectival form is used with the collective suffix -shoung and follows the noun qualified instead of preceding it as above. The verb yei,='become,' takes the dative case, hence sou-la for "ghosts" where one might expect sou.)

## SUBJUNCTIVE.

(Subjunctive particle -ji, conditional particle -si.)

If } Mongko steals the mithun, I shall beat him=  
When }

Mongko-e ngōu { kokalogoji, nge hauto ngāmlam  
                              { koksi  
                              { koksiji

(N.B.—Here the tense of the protasis is really future, but whether it is future or present any of the three forms given may be used.)

When Mongko stole the mithun, I beat him=Mongko-e  
ngou kokjini, nge ngampe.

(N.B.—Here kokjini is the present participle, referring to the time of beating, the tense of which governs the whole clause.)

I beat the man who stole the mithun=au-e ngou kokkeji,  
nge khwoto ngampe.

(lit. who stole the mithun, him I beat.)

I will beat the man who steals mithun=Au-e ngou koklaji,  
nge khwoto ngamlam.

(koklaji is for koklamji or koklabuji.)

## CONTINUATIVE.

Mongko keeps on stealing=Mongko-e kokung kokta.  
 I always kept beating him=nge pambento hauto ngamung ngampe.

## CAUSATIVE.

Yanchu's house has burnt=Yanchu-bu chām chokke.  
 Yanchu has burnt his house=Yanchu-e hauebu chām chok-tike.  
 Kill the "stinker!"=ampakoklok hait'ashi!  
 (N.B.—hait'ashi causative from hai="die".)

## DESIDERATIVE.

Loyum-kalok wishes to kill his elder brother=Loyum-kalok-e hau 'jei-to hai-ti-mang süghake.  
 (N.B.—Perf. tense of -mang sügh- has present sense.)  
 Imtichuba doesn't wish to die=Imtichuba haimang asügha.

## INCEPTIVE.

Thongpang's corpse has begun to rot=Thongpangebu mǎng nyaghla nyāngake.

## COMPOUND VERBS.

Compound verbs are formed in the positive by joining together two roots and conjugating them as one, the important verb standing first, in the usual agglutinative way. In the negative, however, the roots are sometimes separated by a redundant negative affix.

e.g. (1) *cheg*=buy, *ku*=give, > *chegku*=buy and give.  
 e.g. *Nge Ngakula keito chegkuke*=I bought a dog and gave it to Ngaku.

Here the negative of *chegkuke* would be *achegkuke* the single prefix making both verbs negative.

(2) *phe*=ask, *le*=surround > *phele*=to importune. Here however the negative is *aphe-ale*, both verbs taking the negative prefix; so also *takam tale*=don't keep doing.

## INTERROGATIVES.

(1) Questions preceded by an interrogative pronoun do not need any interrogative particle; the interrogative particle *a* may however be used at the end of the sentence e.g.—

*Ai kāmta*=What are you doing?

*Ngo-ho au-e kokke?*=Who stole these mithun?

*Koma haisi, aila yeilam a?*=If Koma dies, what will happen?

(2) Where there is no interrogative pronoun one or more of the interrogative particle **-asao, si, aie, a, lan**, is used.

Of these particles **-asao** is suffixed to the root of the verb and refers to future time, *e.g.*

Will you do it? = **Kam-asao?**

**Si** is used by itself either where no verb is expressed, or in an alternative question where it is suffixed to each of the alternations except the last *e.g.*

Are you a dog? = **No kei si?**

Is Koma a man or a monkey? = **Koma măt-si kumei?**

Will you do it or not? = **Kamlap-si akamlam?**

Has Koma married two wives, or three, or six or ten? =

**Koma yakni-si sām-si lak-si an ngāke?**

Did Koma steal the mithun or buy it? It is said that he stole it = **Koma-e ngou kokke-si chekke? kokke tūgh.**

Has Kaolum gone having done his work, or not having done it? = **Kaolum kamsilei kaman-si akampo sātke?**

**Aie** is used after **si** (the two are sometimes abbreviated into **s'aie**) in simple questions referring to past time.

Did you say that sort of thing? = **nyi kei lau ke si aie?**

Is Kaolum a bad character? = **Kaolum liliti yingke si aie?**

(*N.B.*—Here the tense though present in English is perfect in the Chang idiom, *vide supra* p. 20.)

**Lao** may be used when expressing surprise and expecting the answer "No."

*e.g.* Did you truthfully say that? = **Mai kei lau' lao?**  
(lau' for laua).

Did you really do that? = **Mai khwo kampe lao?**

**Luo** is used in questions expecting answer 'yes.'

*e.g.* Shall I come? = **Lolabu luo?**

Are you well? = **Maishogo kia luo?**

## ADVERBS.

### 1. ADVERBS OF TIME.

Three days ago = **shangăt**  
**theto**

The day before yesterday =  
**shangăt**

Yesterday = **miet**

Today = **thāt**

Tomorrow = **niyet**

The day after tomorrow =  
**chēnyet**

Quickly = **hali**

Soon = **longchi kiyan**

Suddenly = **mangmang**  
**alamlili**

Never = **latankei . . . a-**

Hence forward = **ho-paia, ha-**  
**paia.**

Three nights ago = **shangao**  
**theto**

Three days hence=**hamnyet**  
 Four days hence=**pai-nyet**  
 Formerly=**shā-'ngāt, mets-**  
           **hāngāt**  
 Now a days=**thāt-nyet**  
 Always=**pompento**  
 Again=**tôke**  
 Now=**tou, touji**  
 Then=**kajini**  
 When=**latang**  
 After=**paya**  
 Before=**shāngāt**  
 Daily=**thatkei-thatkei**  
 Some day }=**latang-chichi**  
 One day }  
 At once=**chiung**

Night before last=**shangao**  
 Last night=**miyo**  
 To-night=**thao**  
 Tomorrow night=**niyo**  
 Night after tomorrow night=**cheyo**  
 Three nights hence=**ham-nyo**  
 Four nights hence=**payo**  
 By day=**chalowa**  
 By night=**nangnak**  
 at evening=**chāsām**  
 in the morning=**ngeyang**  
 at cockerow=**aukojini**  
 at midday=**jaji**  
 at midnight=**sauto-metu-**  
                   **bonga.**

## 2. ADVERBS OF PLACE.

Everywhere=**pāntowa**  
 Somewhere=**laoniji**  
 Anywhere=**hagh pang-teguh**  
 Elsewhere=**lubuto**  
 Whence=**lauka, lau-kaunka**  
 Thence=**teika, khwo-kaunka**  
 Hence=**haka, ha-kaunka**  
 Here=**hani**  
 There=**kani**  
 On this side=**hīni**  
 On that side=**thīni**

Near=**nyāngbua**  
 Far }  
 From far }=**sabu, hego**  
 Above=**tikenī, mūgh'ēni**  
 Below=**pange**  
 Before=**tetanga**  
 Behind=**paini**  
 Around=**kaijempu**  
 Aside=**peichelo**  
 Within=**māngei**  
 Outside=**khwong, tǎng**  
 Between=**chinyua.**

## 3. ADVERBS OF MANNER.

How=**lai**  
 Thus=**hai**  
 Slowly=**māngyāngshogo**  
 Truly=**mai**  
 Wholly=**aibo**  
 Mere=**chōnga**  
 Gently=**haugshogo**  
 Silently }=**sāmmeli**  
 Quietly }

Accidentally=**mǎn**  
 Well=**maishogo**  
 Badly=**amaishogo**  
 Attentively=**titsangko**  
 Equally=**chetei**  
 Gratis=**amlang**  
 Slightly=**shībongsho**  
 Alone=**chāmpu-nyung.**

## POST-POSITIONS.

Across=**-tanko**  
 After=**-paia**  
 At=**-a**

From=**-ka**  
 In=**-a**  
 Inside=**-māng**

Because of = -shanga	Of = -bu, ebu
Before = -shāmbu	On = -tak
Behind = -paia	Through = -shetchung
Between = -chinyu	To = -to ; (of persons) -chunto
By = -we, -ei	Towards = -aito
Except = -phoanyu	Under = -pang
For = -la ; -shanga	With = -paito
For (in exchange for) = -lu	With (instrumental) = -i

## CONJUNCTIONS.

And = toke.

Also = ke (enclitic).

But = lan ; pa (preceded by participle in -an or -anyu, or its negative).

Except = phoanyu.

Either . . . or = -si (enclitic to protasis).

Perhaps = yinglam, yingkan, yinglabu ; -lo.

That = togo (following the dependant and preceding the principle clause).

*e.g.* :—

You are good to look at, but for work etc. bad = no  
chüghla maianyu, pa kamla leila amai.

I don't know your name, but I recognize your face = kā-  
nyen anyeko, pa kābu tesinyek shenake.

He gave me money, but it was not enough = haue kăla  
nām kua, lan apan.

I said that Besang had stolen a cow = Besang masu  
kokke togo nge lenke.

## INTERJECTIONS.

Assent hāgh, hoüt, he.

Dissent ügh ("no") ; chi ("that is wrong") ; aki or agi  
(= "not," "none," "there is not.")

Approval hau hau.

Distress augh'a.

Disgust pheh.

To attract attention āō.

## SYNTAX.

The pronoun precedes the noun which it qualifies as a general rule, *e.g.* khwo masu = "that cow," but in cases of emphasis may also follow it, *e.g.* ho-măt-ho-to ngampe = "I beat this very man."

The adjective ordinarily precedes the noun it qualifies *e.g.* thupaibu mătli chüghla amai = "the race of white men (lit.

'white man-seed') is unpleasant to look at," but it may follow it at times, as when the noun is preceded by a pronoun or when there is more than one qualifying adjective, *e.g.*, **khwo nakübu masu maibu**="that good black cow" where **nakübu** (=black) precedes **masu** (=cow) and **maibu** follows it, while **khwo masu nakübu maibu** would be equally correct.

The numeral ordinarily follows the noun, and when there is an adjective with the noun it may follow either, *e.g.* "three dogs"=**kei sām**, "three big dogs"=**kei sām yangbu** or **kei yangbu sām**

Adverbs qualifying a whole clause usually stand in front of the clause that qualify, *e.g.* **thāt lola akilabu**="I cannot come to-day" (**thāt**); **shangat-chie ngo keibu touji shalita**="Once upon a time I was rich, now I am poor." In other cases they precede the verb which they qualify, *e.g.* **Ngaku tOUNGDI leke**=Ngaku came quickly (**tOUNGDI**), **Maishoko kamshi**=do it well (**maishoko**).

The usual order of the sentence is first the subject, then the object, then the verb, *e.g.* **Ngakuē kĀto ngĀmpe**="Ngaku struck me" (**kĀto**), or **ngē Ngakuto ngĀmpe**="I struck Ngaku." When both nearer and both remoter objects are expressed the former does not as a rule take any inflection, but the order in which they are placed as regards one another is immaterial: *e.g.*

**Ngē Ngaku-la** (or **Ngaku-to**) **masu kuke**=I gave Ngaku a cow (**masu**).

**Haue Kilam-bu gau Yanchu-la kuke**=He gave Kilam's land to Yanchu.

In Compound sentence the dependant clauses precede the principal clause, but a common subject of both may stand once at the beginning, *e.g.*

**Alenge kĀto ngĀmlabu togo Kaolum-e lenke**=Kaolum said that Aleng would beat me.

(*N.B.*—The tense of the direct speech is retained in the indirect, Kaolum's words were **Alenge kĀto ngĀmlabu**.)

**Kaolum-e kĀto ngĀmlabu togo lauke**="Kaolum said that he would beat me."

**Aue ngou kokkeji, ngē khwoto ngĀmpe**="I beat the man who stole the mithun" [lit. "who mithun stole (subjunctive), I that man beat"].

#### ORATIO OBLIQUA.

Speech is reported by keeping the exact words spoken and by preceding or following them by a verb of saying. Occasionally this verb of saying may both precede and follow the words reported.

*e.g.* **kān-e aunak-to lam-a shokako lauke**. "**nyi 'kuk-kur-gu' kou'shí!**" **lauke** =The wild cat said to



(lauke) the cock that he would meet (shokako, the word of the direct speech, "I will meet" you) him in the path. "Do you crow 'cock-a-doodle-doo'!" said he.

The enclitics -tūgh and -tōgo (?=tūgh-ko) are also used for "it is said" and "having said" "saying" respectively. But these do not appear to be any other parts of this verb, tūgha, tūghkei, etc. being only used as parts of the verb tūgh-='covet.'

It is said that the chief of Sangtok is a swashbuckler.= Sangtokebu sangbushou lilisizepu-tūgh.

He-togo meibam-shoung angke=The herd of pig agreed and came out.

Meishi kei lauke, "Kābu lang nge longchie kangkuko," lauke. Kei he-togo meishi-la hān-ti-ke. =The deer said to the dog "I will hold your horns a little" said he. The dog agreeing let the deer put them on.

N.B.—He-togo lit.=having said "yes" (he). Ongli-ye nām amai-togo ale =Ongli, saying that the coin (nām) was bad (amai), did not take it.

## SPECIMENS OF THE CHANG LANGUAGE.

### Aunak-si Kan.

Piapo <sup>1</sup>	aunak-si	kānebu	song-si	ho :
In olden time	fowl and	leopard-cat	custom and	manner
kān	aunakto	hātko	kibu.	Hobaji
leopard-cat	fowl	having feared	was	That being so
kane	aunakto	lama	sh'kako	lauke
leopard-cat	fowl	in path	in meeting	said
"Nyi	'kuk-kur-gu'	koushi!"	lauke.	Kane
You	cock-a-doodle-do	crow	said	Leopard-cat
aunak	koujini	chūgsi, <sup>2</sup>	hau	akiko
fowl	while crowing	when see	tooth	not having been
kike.	Kane	ngāma	kakte	takakke.
was.	Leopard-cat	in neck	suddenly	grabbed.
Khwoi	aunak-si	kan	labo.	
Thence	fowl and	leopard-cat	enemies.	

### THE FOWL AND THE LEOPARD-CAT.

In days of old the behaviour of the fowl and the leopard-cat (was thus): the leopard-cat remained in fear of the fowl. Under these circumstances the leopard-cat, meeting the cock on the path, said (to him), "You crow cock-a-doodle-do!" While the cock was crowing, the leopard-cat happened to observe that the cock had no teeth, so he suddenly grabbed him

<sup>1</sup> Piapo, lit. "in our ancestors'" (time).

<sup>2</sup> The termination -si usually has the sense of 'if.'

by the neck. Since then the fowl and the leopard-cat have been enemies.

### Kei-si Meishi.

Piapoa	keila	lang	anganyu	kibu.
In olden time	for dog	horn	having grown	was.
Meishila	lang	akibu.	Mäte	nam
For barking-deer	horn	was not.	Man	oil-seed
shiko	kibu.	Keito	nam	müghke.
having pounded	was.	To dog	oil-seed	was hungry.
Kei	lang	anganyu	shamto <sup>1</sup>	atla
Dog	horn	having grown	in mortar	for entering
amai.	Meishi	kei	lauke	"Kābu
bad.	Barking-deer	dog	said	Your
lang	nge	longchie	kangkuko"	lauke.
horn	I	awhile	will carry	said
he-togo <sup>2</sup>	meishila	hāntike.	Nam	setoā
agreeing	for deer	put on.	Oil-seed	while licking
solangke.	Saiko	lākko	sātke.	Khwola
ran off with.	Dancing	jumping	ran away.	For that
kei-si	meishi	labo.		
dog and	barking-deer	enemies.		

### THE DOG AND THE BARKING-DEER.

Once upon a time the dog used to have horns, while the barking-deer had none. A man had pounded some oil-seed,\* and the dog was hungry for it, but his growth of horn prevented (his head) from going into the mortar.<sup>1</sup> The barking-deer† said to the dog "I will carry your horns (for you) awhile." The dog agreed and put them on the barking-deer, but while he was licking the oil-seed the deer ran off with them, dancing and jumping about as she ran. And this is why the dog and the barking-deer are enemies.

N.B.—The Thado have an identical story of the dog and the goat.

\* *Perilla ocimoides*, L.

† *Cervulus muntjac*.

### Seangtok.

Piapoa	saunyuē	mēsiau <sup>3</sup>	shauko	shauko
Formerly	tiger	animals	having eaten	eaten
lobu.	Hobaji	seangtok	haghuyoek.	Lapan
came.	And so	tortoise	met.	Having caught
changsike	shaulao-togo	anin.		Hobaji
struck	will eat saying	could not.		And so

<sup>1</sup> i.e. into the hole in the wooden table or "okuli" in which grain is pounded.

<sup>2</sup> lit. "Yes-saying" (togo < tūgh-ko).

<sup>3</sup> mesiau, lit. 'animals and birds.

meishameikok	woklongto	tegan	chingke ;
bad animal	sago palm	threw	down
longla	amaiko <sup>1</sup>	kike.	Hobaji
for getting out	being bad	was.	And so
meiban-shoung	gau	yūgan	lūghsūghke.
herd of wild pig	earth	having turned up	arrived.
Seangtoke	"Melbam-shoung,	woklong	yūgan
Tortoise	Herd of wild pig,	sago palm	having turned up
apanyo	ngo	songanke.	Kāne ngo
having thrown away	me	release.	You me
songanlōgōji	shaula-yungla-bu <sup>2</sup>	lenlap,"	lauke,
if having released	eating-drinking things	will tell,	said
"niesak-niesakpu	kato	angsi	shaula-yungla-bu
early in the morning	there	if emerge	vitals and drink
kia,"	lauke.	He-togo meibam-shoung	niesakputo
is,	said.	Agreeing	herd of pig
angke.	Angsi	mātebu sieka	shatlangke.
emerged.	Whenever emerged	of man	in field
Hobaji	matebu	lang	khwoi
And so	of man	crops	thence
			is eating.

## THE TORTOISE.

Once upon a time the tiger went about eating up all the animals until he met with the tortoise. Him too he caught and smote, intending to (kill and) eat him, but could not. So the spiteful creature threw down a sago-palm in such a way that it pinned (the tortoise) down. After a while a herd of wild pig came along, rooting up the earth. "Pigs," said the tortoise, "root up this sago-palm, throw it aside and release me! If you release me, I will tell you where to find food and drink. If you come out early in the morning at the place I will tell you of, you will find (plenty) to eat and drink." The herd of pig complied with his request, and early in the morning came out (where the tortoise told them). The place at which they came out was the field of man, so from that time they continue to eat man's crops.

Anyang-sānkang.<sup>3</sup>

Piapo	yaksa	māt	ni	chelūgh	kwokla
Once upon a time	women	man	two	fibre	to strip
yam-to	kōke.	Māt	chie-e	"Nona,	nyi
to jungle	went.	Man	one	Dear,	you
chelūgh	phoko-phoko	leta	si	ai?"	
fibre	putting down	putting down	taking	eh?	

<sup>1</sup> With verbs expressing a quality a Chang uses the past where we use the present tense.

<sup>2</sup> Lit. 'for eating for drinking' with the adjectival termination bu.

<sup>3</sup> Anyangsankang = *Sida rhumbifolia*, L.

lauke. Lūbu-e hau-māt-pam-e chie kǎnanyu,  
 said. Other herself alone one having carried  
 yepechauko "Phoko-phoko leta" lauке.  
 telling a falsehood putting down taking said.  
 Hobaji amlang ngūgh shanga, phebu  
 And so false word because of, who had asked  
 paushi-e chelūgh phoake. Unlanglamto  
 old woman fibre put down. When climbing back  
 lubu-e "Nona, ungako" lauке. Khwo  
 other dear will go said. That  
 paushi-e "Nyi laubu-la phoke" lauanyu  
 old woman you for having said put down having said  
 yaksa lubu-e ungke, khwo ungla amaiko  
 woman other went up, that for going up will be  
 kike. Chelūgh lamto-a nangnakanyu  
 bad stayed. Fibre while searching having become dark  
 pukōk-to atanyu yep mangsūghke.  
 in a hole in a tree having entered to sleep wished.  
 Saunyushou khwoni kike. Khwopaia longchie  
 Tiger-cubs there lived. Thereafter awhile  
 kianyu saunyupi-e meishi thunganyu longke.  
 having waited tigress deer having carried came.  
 Paushi-e hatko kibu ka shitkāng shitke  
 Old woman from remaining in fear broke wind.  
 Saunyu-e hatko meishi tekan apanyu  
 Tiger fearing deer having thrown away  
 sātke. Paushi langnianyu meishi-bu sǎnsimāng  
 fled. Old woman it having lightened deer's liver  
 sunganyu kampuke. Thungan shauanyu  
 having taken out carried off. Having cooked and eaten  
 chie phoke; khwo-pai-a paushi  
 one (bit), put aside; thereafter old woman  
 lubu-e chām-to loanyu "Ai-ebu sǎn  
 other to house having come Of what liver  
 shauta?" pheke. Khwo-e "Ngou-bu<sup>1</sup> sǎn  
 eating asked. That Mithun's liver  
 shauta" lauке, Hobaji lubu-e "Nona,  
 eating said. And so other Dear,  
 laka happe?" pheke. Paushi khwo-e  
 wherefrom got? asked. Old woman that  
 "Nyi-noebu<sup>2</sup> chikap hianyu ngou-bu  
 Aunt's sisters' bracelets having asked for mithun's

<sup>1</sup> The gayal, *Bos frontalis*.

<sup>2</sup> Nyi=a father's sister, a husband's mother, a mother's brother's wife, or a wife's mother.

no=an elder sister, including, of course, cousins senior in point of age or birth. Its use always implies respect. The whole phrase, nyi-no, is intended to include all the important female relatives, people to incur whose wrath would be a serious matter.

shingkāt-to	phekan	angtianyu	săn
anus-into	having put in	having put right up	liver
phekanke "	lauke.		
withdraw	said.		
Paushi	lubu-e	maimaitham-togo	
Old woman	other	quite true saying	
tâmpe.	Hobaji	nyi-noebu	chikap
thought.	And so	aunts' sisters'	bracelets
pandoto	hianyu	kāpanyu	ngou lāmīa
all	having asked for	having put on	mithan to look for
hauke.	Ngou yam-a	happe.	Sătyela loke.
went.	Mithun in jungle	found.	For defecating came.
Hobaji	mei	pakansi	shingkāt-to yik-e
And so	tail	when raising	into anus arm(by)
phekantike.	Ngou-e	hatanyu	thuanlangke.
thrust in.	Mithun	being frightened	dragged away.
Paushi-e yik	sunganla	atikko	hāppu hāppu
Old woman arm	for withdrawing	being unable crying	crying
sănlăngtike.	Khwopaia	anyangsănkang	
made to drag along.	Thereafter	'anyangsănkang'	
haghyusi	lubu	yik-e	"Anyangsănkang"
when meeting with	other	hand by	Cousin Hard One
late!"	togo	hătke.	Anyangsănkang a-
help	saying	seized.	Cousin Hard One not
-ngokko	yik	sunganla	mai ke. Hobaji
breaking	arm	for withdrawing	availed. And so
chikap	yik-ka	sungananyu	ngou-bu
bracelets	from arm	having pulled off	mithun's
shimung-a	kănanyu	sătke.	
belly in	having carried	ran away.	

## COUSIN HARD ONE.

Once upon a time two women went to the jungle to strip bark for string. One of them said (to the other) "Are you collecting your fibre and putting in one place, dear?" The other, who was carrying about with her the only (piece she had found), falsely replied "I am doing so." And on account of this lie the old woman who had asked put her fibre down. When climbing back the second old woman said "I am going home, dear." When the first replied "Because of what you said, I have left (my fibre) behind," the second went off home. The first stayed, since she could not go back. While looking for her fibre, it got dark, and she went into a hollow tree to sleep. There were tiger-cubs living in there, and after she had been there awhile, the tigress came in with a deer. The old woman, for the fear she was in, broke wind. The tigress, frightened, dropped the deer and fled. When it got light, the

old woman took out the liver of the deer and carried it off. She cooked and ate it, but put a bit aside. Afterwards the second old woman came to her house. "What liver is that you're eating?" asked she. The first answered "'Tis mithun's liver I'm eating." On that, "Wherefrom did you get it at all, dear?" asks the second. Says the first, "I borrowed the bracelets of my aunts and elder sisters (to protect my arm), and I thrust my arm into a mithun's vent and putting it right up, I pulled out the liver," says she.

The second old woman really thought this was true, so she borrowed all the bracelets of her aunts and elder sisters and put them on and went to look for a mithun. She found a mithun in the jungle; it was going to defecate. When it lifted its tail, she put her arm into its vent. The mithun took fright and dragged her along. The old woman could not get her arm out, and bellowing and howling she was pulled along. At last she met with the 'anyangsankang,' "Help! Cousin Hard One!" she cried, and seized it with her other hand. Cousin Hard One did not break, but was stout enough to pull her other arm out. But the mithun pulled the bracelets off, and galloped away with them in his belly.

### TERMS OF RELATIONSHIP.

The Chang Nagas are as at present constituted, an exogamous and stoutly patrilineal tribe, and are of mixed origin. They prohibit marriage between a man and his immediate relations on his mother's side, though this prohibition seems to be in the process of breaking down, as such unions nowadays take place in spite of the disapproval of the older generation. The tribe is composed of a number of different clans each of which claims descent from a common ancestor. Property passes through the male line, and women cannot ordinarily inherit at all.

In the relationship terms given below, it will be noticed that while some of them begin, with an initial *a* others are shewn as beginning with an apostrophe. Those beginning with the *a* are used as they stand without the addition of any pronominal adjective when addressing the person denoted by the term; when they are used with reference to such a person but in speaking to another, the *a* is elided and the pronominal adjective takes its place—*kū* or *kū̃*, = 'my', *kā* = 'your', *haru*, = 'his', etc. In the case of the terms shewn as beginning with an apostrophe the pronominal adjective of the first person is always prefixed when addressing the person denoted.

The terms used are the same, whether a man or woman is speaking, except where they are differentiated by the use of the letters *m. s.*, *w. s.*, after the term used.

Father	..	..	apo	
mother	..	..	anyu	
elder brother	..	..	ajai	
elder sister	..	..	ano	
younger brother	..	}	ana	[ordinarily the personal name is used, but on intimate occasions ana (or 'na).]
younger sister	..			
father's brother	..	..	apo	(in address). In speaking to a third person 'po would be used followed by the personal name. If great precision were necessary 'po-jai-shō-po, or 'po—na—shōpo as the case might be.
father's brother's wife	..	..	anyu	followed by personal name.
father's sister	..	..	anyi	
father's sister's husband	..	..	akō	
mother's brother	..	..	akō	
mother's brother's wife	..	..	anyi	
mother's sister	..	..	anyu	or anyu followed by the personal name, in address, otherwise 'nyu-no-shōnyu or nyu-na-shōnyu as the case may be.
mother's sister's husband	..	..	apo	followed by personal name.
grandparent	..	..	api	used in address; in speaking to a third person 'pimai <sup>1</sup> is used for an actual grandparent on the father's side, and 'pi for one of that generation; to distinguish sex 'poshopi (masc.,) and yaksapi (fem.,) are used for the paternal grandparents, 'nyubu-po (= 'mother's father') etc. for the maternal.
husband	..	..	..	personal name used in address; in reference 'lau' (=husband.) or 'chāmpapo (= 'male-form-the house') are used.
wife	..	..	..	personal name used in address; in reference 'yak (=wife) or chāmpanyu (= 'female-from-the house') are used.
wife's father	..	..	..	akō
wife's mother	..	..	..	anyi
husband's father	..	..	..	akō

<sup>1</sup> mai='true,' 'real.'



husband's mother	..	..	anyi
daughter's husband	..	}	'li. but in calling aloud, as from a distance, the personal name is used.
son's wife	..		
wife's brother		}	hauko <sup>1</sup>
sister's husband ( <i>m. s.</i> )			
sister's husband ( <i>w. s.</i> )		}	pepō
husband's brother			
wife's sister	..	..	haunyu, or penyu.
brother's wife ( <i>m. s.</i> )	..	..	penyu
brother's wife ( <i>w. s.</i> )	..	}	haunyi, or anyǎng, (or ano if much older than speaker).
husband's sister	..		
wife's sister's husband	..	..	pepō
husband's brother's wife	..	..	nauna if of same clan as speaker; otherwise anyǎng; ano is also used to a senior.
son's wife's father	..	..	hauko
son's wife's mother	..	..	haunyu if of different clan, haunyi if of same clan.
son	..	}	'shō [personal name used ordinarily, 'shō on intimate occasions].
daughter	..		
brother's son ( <i>m. s.</i> )	..	..	'shōmaupō
brother's daughter ( <i>m. s.</i> )	..	..	'shōmaunyu
brother's child ( <i>w. s.</i> )	..	..	'li
husband's brother's son	..	..	'shōmaupō
husband's brother's daughter	..	..	'shōmaunyu
wife's brother's child	..	..	'li
sister's child ( <i>m. s.</i> )	..	..	'li
sister's child ( <i>w. s.</i> )	..	..	'shō
wife's sister's child	..	..	'shō
father's sister's son	..	}	'nyangi, but not so common in address as personal name; in reference 'nyangipō.
mother's brother's son	..		
father's sister's daughter	..	}	'nyangsau, but less common in address than personal name in reference 'nyangsaunyu.
mother's brother's daughter	..		
father's brother's son	..	..	ajai if older than speaker; if younger ana on intimate occasions, on others, personal name.
father's brother's daughter	..	..	ano if older than speaker; if younger ana on intimate occasions, on others personal name.

<sup>1</sup> hauko, haunyu, haunyi—said to be a combination of hau='his' or 'her' and ako, anyu, anyi, the hau referring to the speaker's child to whom the person designated will be ako, anyu or anyi as the case may be. This, at any rate, was the explanation given me by the most intelligent Chang I know.

mother's sister's son	..	<b>ajai</b> followed by personal name, to an elder; to a younger, name only, but 'na on intimate occasions.
mother's sister's daughter	..	<b>ano</b> followed by personal name, to an elder; to a younger, name only, but 'na on occasions.
grandchild	.. ..	<b>'shi</b>

*N.B.* **ajai** and **ano** are frequently used merely to show respect, instead of the strictly appropriate terms.

### GREETINGS.

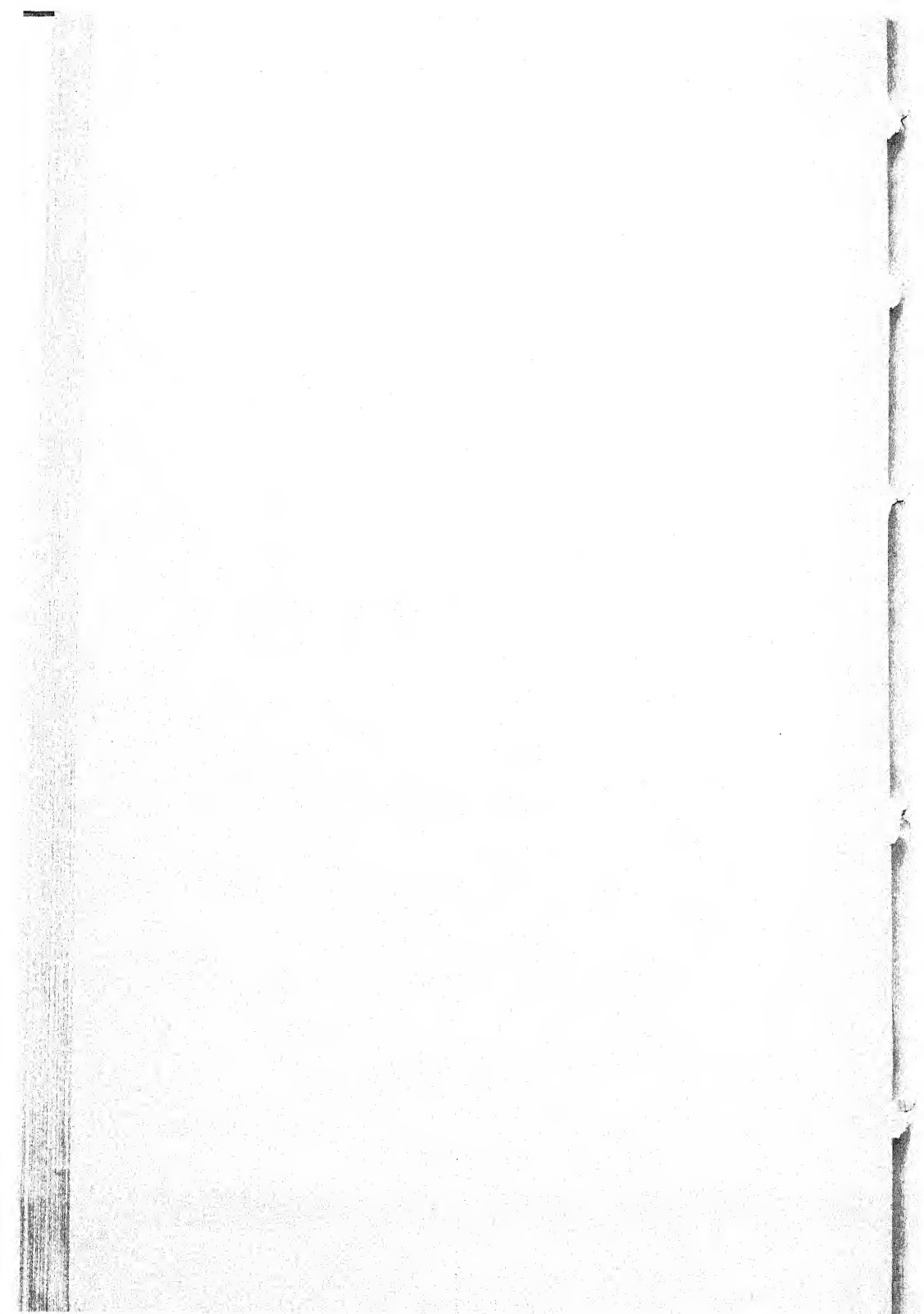
On meeting—**maishogo kia luo?**—*Are you well?*

Answer—**maishogo kia**—*I am well.*

Reply by first speaker—**thomai**—*Good.*

On parting—**no**, answered by **hoüt**.

*N.B.*—**No** is ordinarily preceded by **ungta** (*am going home*) or **ngaita** (*am turning back*) etc., and **hoüt** is usually followed by some such expression as **maishogo ungshi** (or **ngaishi** as the case may be) = 'fare well,' but the use of **no** and **hoüt** on taking leave is imperative between persons wishing to observe good manners.



## VOCABULARY.

*N.B.*—*h.p.* or *l.p.* (*p.* = pitch) after a word indicates that the tone is high or low accordingly.

### A

A, An	..	..	..	chie
Abandon	..	..	..	api-(neg. ipi-)
Abate	..	..	..	{ hăp-(intr. of water, neg. uhüp-) ăp-(tr. of prices neg. iip-)
Abdomen	..	..	..	shimung
Abet	..	..	..	thui-
Abide	..	..	..	ki-
Able	..	..	..	tik-; sūgh- (of carrying)
Abode	..	..	..	kishang
Abortion	..	..	..	sāme shangatpu
About, <i>adv.</i>	..	..	..	hīnike tīnike
About, <i>postpn.</i>	..	..	..	shangă
Above	..	..	..	mūgha
Abreast	..	..	..	hŭpshīyàn
Abuse, <i>vb.</i>	..	..	..	hak-, kük-
Accept	..	..	..	le-
Accurate	..	..	..	maimetham, mai
Accusation, make, <i>vb.</i>	..	..	..	phiyu-, ngūgh phiyu-,
Ache, <i>vb.</i>	..	..	..	shāt-
Acid, <i>adj.</i>	..	..	..	haichappu
Acquaintance	..	..	..	yembo
Acquire	..	..	..	hăp-(neg. ūhup-, ihip-)
Active	..	..	..	yosoubu (lit. light legged)
Advance	..	..	..	tetàngto hau-
Adversary	..	..	..	{ tangpu-lebu (private enemy) lapo, labo, la, (public enemy)
Advice	..	..	..	ngūh mai
Adult	..	..	..	chingkăma
Adulterate	..	..	..	kom-
Adulterer	..	..	..	thāngpo
Adulteress	..	..	..	thāngnyu
Afar	..	..	..	ulanji
After	..	..	..	paia
After-birth	..	..	..	ongchong; sāmkung (also used but incorrectly)
Afternoon, in the	..	..	..	chaji-paia
Afterwards	..	..	..	hobaji, paianyu
Again	..	..	..	han

Against	..	..	..	-to (in some senses)
Aged	..	..	..	paushi
Agile	..	..	..	săpsăpmembu
Agree	..	..	..	he lau- (when near), hoüt lau-(when distant)
Agreement	..	..	..	māngchie (lit. of one mind)
Ague	..	..	..	māngpōk
Ahead	..	..	..	tetangto
Aim, <i>v.</i>	..	..	..	tăkte-
Air	..	..	..	yei
Alike	..	..	..	tigü
Alive	..	..	..	langbu, langkebu
All	..	..	..	păndo
Alone	..	..	..	(mătpăm) chiyong
Along with	..	..	..	paito
Aloof	..	..	..	lulu
Aloud	..	..	..	kāng (lau-)
Already	..	..	..	tou
Also	..	..	..	-kei, -ke
Alter, <i>v.</i>	..	..	..	chei-
Alternately	..	..	..	cheyulangoko
Always	..	..	..	pompănto
Ambush, ( <i>n.</i> )	..	..	..	thobu
Ambush, ( <i>vb.</i> )	..	..	..	tho-
Among, <i>postpn.</i>	..	..	..	chia ; yua (in different senses)
Ancestors	..	..	..	pisipou
Anciently, of old	..	..	..	piapoa
And	..	..	..	tokei, takei; -si (enclitic to first of two nouns)
Angry, ( <i>adj.</i> )	..	..	..	kāwàngbu
Angry, be, ( <i>vb.</i> )	..	..	..	kāwàng-
Animal	..	..	..	mesiau
Ankle	..	..	..	yōnyek
Annoyance, give, ( <i>vb.</i> )	..	..	..	oti chakti-
Annoyed, be, ( <i>vb.</i> )	..	..	..	o- chak-(a double <i>vb.</i> both roots being conjugated; neg. üö achak-)
Another	..	..	..	lubu chie
Answer, <i>v.</i>	..	..	..	chongeti-, chongei; langai-, langaiti- (of answer sent from a distance)
Ant (generic)	..	..	..	mín
Ant (black)	..	..	..	lāngmín (large), tăksho (small)
Ant (white)	..	..	..	lāngshāng; tām (lit. earth)
Ant (winged termites)	..	..	..	lāngngo (lit. idiot ant)
Ant (red)	..	..	..	mínsăk (large), mímmei (small)
Ant-hill	..	..	..	mínhüp

Antler	..	..	..	sāklāng
Any	..	..	..	aiji; haubongteko
Anybody	..	..	..	auji
Anything	..	..	..	ai'ejipesilei, ajamjam pesilei
Anywhere	..	..	..	hanbongteko
Apart	..	..	..	lulu
Apartment	..	..	..	shemchǎng, (a sort of cubicle screened off in outer room) porch=sangchimbang main room=chamang pantry=jakchuen back room=mabongsi (lit. "wind breaker;" and not a Chang word) machan=shuan, phang
Ape	..	..	..	uô (huluk), yuo (langur)
Apple	..	..	..	shongpi
Apply, <i>vb. tr.</i>	..	..	..	nāng-
Approve, <i>v.</i>	..	..	..	maigu-
Arise	..	..	..	lāksāb-(from recumbent posture), lu- (from sitting posture)
Arm	..	..	..	yik
"Armadillo" (pangolin)	..	..	..	kaumei [(ivory).
Armlet	..	..	..	maikāp (brass), kǔngkāp
Armpit	..	..	..	pakpang, pagamang
Around	..	..	..	kaijam, kaijampu.
Arouse, <i>v.</i>	..	..	..	kāng-
Arrest, <i>v.</i>	..	..	..	sǎn-, lang sǎn-
Arrive, <i>v.</i>	..	..	..	lūghsūgh-
Arrogant	..	..	..	līlīsizēpu
Arrow	..	..	..	lauchin
Article	..	..	..	pēsilei
Ascend	..	..	..	mūghe āng-(neg. u'ang-)
Ash	..	..	..	tāp
Aside	..	..	..	aghbu, thōnbu.
Ask	..	..	..	phi-
Ask for	..	..	..	hi- (neg. ihi-)
Aslant	..	..	..	tautokpu
Assemble	..	..	..	kāmshe-(tr. and intr.)
At once	..	..	..	tō-hali
Avaricious	..	..	..	chēbu-shibu
Aunt	..	..	..	ānyi, ānyumaunyu.
Autumn	..	..	..	sauvonchini
Auspices, take, ( <i>vb.</i> )	..	..	..	pāng li-
Auspices, ( <i>n.</i> )	..	..	..	pāng ( <i>l.p.</i> )
Await	..	..	..	hai-(neg. ihi-)
Awake, <i>v. intr.</i>	..	..	..	pi-
Axe	..	..	..	wo

## B

Baby	..	..	..	nāshōsi
Bachelor	..	..	..	lāpou
Back, <i>adv.</i>	..	..	..	pai
Back, <i>n.</i>	..	..	..	tāk
Back-door	..	..	..	pālak-kōkān
Backwards	..	..	..	pai
Bad	..	..	..	amai
Bag	..	..	..	nyinkau
Baggage	..	..	..	pēsīlei
Bail, <i>n.</i>	..	..	..	sobu
Bald	..	..	..	khunkēbu (bald in front); kulo-iyangbu (without hair in the head)
Bamboo	..	..	..	ngāt
Bandage, ( <i>vb.</i> )	..	..	..	kūgwa-
Bang	..	..	..	hāk
Bar, (the door) <i>v.</i>	..	..	..	(ko) khin-
Bar, (for door) <i>n.</i>	..	..	..	kōkhinchin
Barber	..	..	..	khūshubu-māt
Bare, <i>adj.</i>	..	..	..	saubobu
Bark, (of dog) <i>n.</i>	..	..	..	lāng; ngūgh
Bark, <i>v.</i>	..	..	..	ngong-, wong-
Bark (of tree)	..	..	..	(pu) khōn
Barren	..	..	..	ongkongbu (of women); lang- bu (of animals): lāngamaida (of land)
Barter, <i>n.</i>	..	..	..	namyākchi
Barter, <i>vb.</i>	..	..	..	chekwa-
Base, <i>n.</i>	..	..	..	shing (lit. arse)
Bashful	..	..	..	himobu
Basin	..	..	..	tei-thung (of bamboo)
Basket	..	..	..	kām
Bask, <i>v.</i>	..	..	..	chānyu chōkbu-a sāt- (lit. 'sit in sun-warmed [place]')
Bastard	..	..	..	kongshou
Bat, <i>n.</i>	..	..	..	pak
Bathe, <i>v.</i>	..	..	..	mang yu-(of body); tiengyāt-(of face)
Battle, do, <i>vb.</i>	..	..	..	wāpyu-
Be, <i>vb.</i>	..	..	..	ki-
Bead	..	..	..	yāk
Beak	..	..	..	kung
Beam	..	..	..	kāmtāk (in walls); chāmtāk (in roof); ausung (roof tree)
Bean	..	..	..	shūmei; mōwēnshu (smell- ing bean)
Bear, <i>n.</i>	..	..	..	sāp



Beard	..	..	..	kaushǎngwi
Beat, <i>v.</i>	..	..	..	ngǎm-
Beautiful	..	..	..	chügla maibu
Because	..	..	..	-shangá; -bāji, -bajiba
Beckon, <i>v.</i>	..	..	..	yik ngôm-
Become	..	..	..	yei-
Bed	..	..	..	shün, shen; yepshǎng
Bed-ridden	..	..	..	pola asüghbu
Bee	..	..	..	nau
Beef	..	..	..	masupi
Beetle (dung beetle)	..	..	..	sättöng
Before	..	..	..	tetangto [ihyung-)
Beg, <i>v.</i>	..	..	..	hishau-hiyung-(neg. ihishau
Beggar	..	..	..	hishau-hiyungbu-măt
Begin, <i>v.</i>	..	..	..	kāng-(following gerund in la of verb of action to be begun)
Begone	..	..	..	ko
Behead, <i>v.</i>	..	..	..	khu tǎd-
Behind	..	..	..	pai
Belch, <i>v.</i>	..	..	..	kin ngaiti-(lit=return vomit)
Bellow, <i>v.</i>	..	..	..	wi-, vi-
Belly	..	..	..	shimung, shumung
Belly-ache	..	..	..	shimung shätta ( <i>vb.</i> =stomach aches)
Below, <i>postpn.</i>	..	..	..	-pangá
Below, <i>adv.</i>	..	..	..	pangei
Bend, <i>v.</i>	..	..	..	dakán komti-
Besides	..	..	..	tokei
Best	..	..	..	pandoto maibu
Bet	..	..	..	theyo-
Betel	..	..	..	kuijang
Between	..	..	..	chinyua
Beware	..	..	..	māng sang-
Beyond	..	..	..	tānanki
Big	..	..	..	yangbu
Bile	..	..	..	kawekpu
Bind, <i>v.</i>	..	..	..	kūgh-
Bird	..	..	..	ao
Bird-cage	..	..	..	loenkang
Bird-lime	..	..	..	nai
Bird-nest	..	..	..	aohǎp
Birth, give, <i>vb.</i>	..	..	..	puk-(of all viviparous beings), hǎp- (neg. ühüp) (of human beings, used with na=child), shāt- (with shōshou, of cattle, deer and larger mammals), sit- (with shōshou, of dogs, pigs, cats, and smaller animals)

Bitch	..	..	..	keinyu
Bite	..	..	..	tāk-
Bitter	..	..	..	khawükpu, khauekpu
Black	..	..	..	nakübu
Black-guard	..	..	..	lilisizepu-măt
Black-smith	..	..	..	namyaghbu-măt, namyagh-măt
Bladder	..	..	..	okpong
Blank	..	..	..	sauputham, sakteishogo
Blaze	..	..	..	wanlugh
Bleat, <i>v.</i>	..	..	..	wi-, vwi-
Bleed, <i>v. intr.</i>	..	..	..	si ang-(neg. ū'ang or iang-)
Blind	..	..	..	nyektubu
Blister	..	..	..	aotei (lit. "bird water" <i>i.e.</i> "egg" verb ang-; thus aotei angke=a blister has arisen)
Blockhead	..	..	..	ngōbu
Blood	..	..	..	si, singou
Bloom (flower)	..	..	..	chiben
Blow, <i>vb.</i>	..	..	..	măt-
Blue	..	..	..	pi; müghsāk (very dark blue)
Blunder	..	..	..	măt hăb-(neg. ühub-)
Blunt	..	..	..	ü'akpu
Blush	..	..	..	tesinyek satlambu (lit. face red)
Boar	..	..	..	meishou (wild), okloshou (domestic)
Boastful	..	..	..	lilisizepu
Boast, <i>vb.</i>	..	..	..	lilise ying-
Boat	..	..	..	long
Boatman	..	..	..	longa-pongbu-măt
Body	..	..	..	măng
Boil, <i>v.</i>	..	..	..	lai-(intrans.), laiti-(trans.)
Boil, <i>n.</i>	..	..	..	pokpu; sensen (very large), takshou (very small), [ <i>verb</i> ang-]
Boiling	..	..	..	laibu
Bold	..	..	..	măngpong-yangbu
Bone, <i>n.</i>	..	..	..	luo
Book	..	..	..	lie (lit. leaf), ngügh-lie (lit. word-leaf)
Boot	..	..	..	ngōk (lit. "hoof")
Border, ( <i>adj.</i> )	..	..	..	thoan, thōn; thoana,
Borrow, <i>v.</i>	..	..	..	loat-, lōt- ( <i>N.B.</i> the reflexive imperative lōtpu means "lend (me)")
Bother, <i>vb.</i>	..	..	..	kichimti-(withdativeusually)
Bottom	..	..	..	shing

Boundary	..	..	..	leilang
Bow, <i>n.</i>	..	..	..	lau
Bow string	..	..	..	lau-buk
Bowels	..	..	..	oksi
Bowl	..	..	..	pagh
Box	..	..	..	pusan
Boy	..	..	..	nāshōsi
Bracelet	..	..	..	chikap
Braggart	..	..	..	yonglambu
Brains	..	..	..	haih
Bramble	..	..	..	bīh
Branch	..	..	..	puphyek
Brass	..	..	..	mang
Bread	..	..	..	wantek
Break, <i>v.</i>	..	..	..	nīn- (intr.), nīnti- (tr.)
Breast	..	..	..	sūn
Breath	..	..	..	hāk
Breathe, <i>v.</i>	..	..	..	hāk hin-
Breeze	..	..	..	yeisangshou
Brethren	..	..	..	chaisena
Bright	..	..	..	mǎngkēshōku
Brim	..	..	..	kaushang (lit.= "chin")
Brimful	..	..	..	shennetnyu
Bring, <i>v.</i>	..	..	..	songba-(imperative songba)
Broad	..	..	..	phōbōh
Brook	..	..	..	shumang
Broom	..	..	..	chām-kujin
Brother	..	..	..	ajei <sup>1</sup> (elder), ana (younger; also= younger sister)
Brother-in-law	..	..	..	kōnyāngbo
Brow	..	..	..	khūngcha
Brown	..	..	..	saklangbu (red), mōnjungbu (drab).
Bubble	..	..	..	ukpong, okpong (lit. = "bladder")
Bud, <i>n.</i>	..	..	..	chiben thongbu (lit. "flower not yet open"); puan
Buffalo	..	..	..	tiek, tek (domestic), mūghka tek (wild)
Bug	..	..	..	ih ( <i>l.p.</i> )
Bugle	..	..	..	puthung
Build, <i>v.</i>	..	..	..	tang- (of house, etc.); (hǎp) tāk- (build nest or den of birds and animals), (hǎp) pau-(of bees, etc.)

<sup>1</sup> This is the form used in address, when the form without the initial a- is used it is ordinarily pronounced jal.

Bull	..	..	..	māsupang ; masupongsu (herd bull)
Bully	..	..	..	līlīsizēpu ( <i>adj.</i> )
Bullet	..	..	..	namlang (= "gun fruit")
Burden	..	..	..	ōōn
Burn, <i>v.</i>	..	..	..	chik-(intr.), chikti-(tr.)
Bury, <i>v.</i>	..	..	..	kān-
Bush	..	..	..	achingalambu pu
Busy	..	..	..	kāmsile ; asauta ( <i>vb.</i> = is not at leisure)
But	..	..	..	pa
Butterfly	..	..	..	phatuh
Buy, <i>v.</i>	..	..	..	cheg-
By-and-by	..	..	..	longchie kianyu (lit. having waited a space)
Bypath	..	..	..	koalam

## C

Cackle, <i>v.</i>	..	..	..	taguek-
Calf (of leg)	..	..	..	youshun
Calf (of cow)	..	..	..	masushou
Call, <i>v.</i>	..	..	..	ngā-
Cane, <i>n.</i>	..	..	..	li ( <i>l.p.</i> )
Capsicum	..	..	..	houngchep
Capture, <i>v.</i>	..	..	..	sānat-
Carcass	..	..	..	haibu mang
Care, <i>v.</i>	..	..	..	sangkang- (lit. = "be afraid")
Carry, <i>v.</i>	..	..	..	kān-
Castrate, <i>vb.</i>	..	..	..	lākli- ; songpāt- (more polite, the former not used before women)
Cat	..	..	..	tānila (domestic), kān (wild)
Cataract	..	..	..	leglek
Catch, <i>v.</i>	..	..	..	chabat- (as a ball, etc.; sanat-, lāp- (capture).
Caterpillar	..	..	..	yāng (= insect generally)
Cease, <i>v.</i>	..	..	..	liti-
Centipede	..	..	..	keklyek-pīsat
Centre	..	..	..	chi, chinyu
Certainly	..	..	..	maimetham
Chance	..	..	..	mūghka (lit. "spirit", "from sky")
Change, <i>v.</i>	..	..	..	jeyu-, cheyu-
Channel	..	..	..	piyungkan
Character	..	..	..	jampen ( <i>l.p.</i> ) <sup>1</sup>
Charcoal	..	..	..	wankak

<sup>1</sup> jampen *h.p.* = jack-fruit.

Chase, <i>v.</i>	..	..	..	shi-
Cheap	..	..	..	nāmsōbu
Cheat, <i>vb.</i>	..	..	..	kom-(lit.= 'throw in hastily' > used of cheating by in- sertion of bad stuff, stones, etc. among goods dealt in)
Cheek	..	..	..	ōwōmlang
Chest, of body	..	..	..	kūklang, kukhu
Chestnut (edible)	..	..	..	hauchăk
Chew, <i>v.</i>	..	..	..	nyai-; (of tobacco—măm-)
Chicken-pox	..	..	..	pöblishăt
Chide, <i>v.</i>	..	..	..	kug-
Chief, <i>n.</i>	..	..	..	sanglipo; sangpushou
Child	..	..	..	nashōsi
Childhood	..	..	..	shōsi
Chin	..	..	..	kaushang
Choke, <i>v.</i>	..	..	..	nangăt-(intr.); nyat-(tr.)
Choose, <i>v.</i>	..	..	..	le-(lit.= 'take')
Circular	..	..	..	yenthuthăm
Circuitous	..	..	..	-nong (in compounds, <i>e.g.</i> lamnong = "circuitous path", tei nong = "cir- cuitous stream")
Civet-cat	..	..	..	küh
Clan	..	..	..	pang (of men), sau (of women)
Claw	..	..	..	yiksăn (of hand or fore-paw), yōsăn (of foot or hind paw)
Clay	..	..	..	thamtak
Clean, <i>adj.</i>	..	..	..	saupobu, săktebu <sup>1</sup>
Clean, <i>be, vb.</i>	..	..	..	saupo-, săkte-
Clean, <i>vb. tr.</i>	..	..	..	săkale-, chong-
Clear	..	..	..	saupobu metaphorical as well as literal), săkte-shoku (only used of water, glass, etc.)
Cliff	..	..	..	lăk
Climb	..	..	..	ang-(neg. ü-ang-; followed by accusative)
Clothes	..	..	..	nei
Cloud	..	..	..	sangmei
Cobweb	..	..	..	keglak-chăm
Cock	..	..	..	aupang
Cocoon	..	..	..	(yangebu) hăp

<sup>1</sup> *N.B.*—When speaking of the human body săktebu is used only of actual cleanliness from dirt, and saupobu of ceremonial cleanliness only; *e.g.* if a man be about to go hunting which requires that he shall have remained chaste the preceding night, it may be said of him "he can go" (or "he cannot go") "as he is clean"—saupobu (or "as he is unclean"—asaup).

Cohabit, <i>v.</i>	..	..	..	cham-
Cold, be ( <i>vb.</i> )	..	..	..	kām-
Cold ( <i>adj.</i> )	..	..	..	li (of water, metal, etc.)
Cold season	..	..	..	puang, pwang
Collect, <i>v.</i>	..	..	..	kāmshe-
Comb	..	..	..	kusei
Come, <i>v.</i>	..	..	..	lo-; lota-(imper. kayeta!)= come in: lōng-(imp. kaya- nga!)=come out or up; lowen-(imp. kayenna!)= come down
Come here!	..	..	..	ka!
Comet	..	..	..	kānyāng-yangbu
Command, <i>v.</i>	..	..	..	ngūghkām kuashi
Commerce	..	..	..	nāmyāk
Companion	..	..	..	yempo
Compensate, <i>v.</i>	..	..	..	phōphan ku-(lit.=give in excess)
Complete, <i>v.</i>	..	..	..	kāmpām-; ying-(of certain thing only)
Conch	..	..	..	thouk
Confine, <i>v.</i>	..	..	..	kailab-
Conflict, take part in, <i>vb.</i>	..	..	..	lungyu-
Confusion	..	..	..	sāvesai, peksek
Consider, <i>v.</i>	..	..	..	mānga tāmān chūg-
Converse, <i>v.</i>	..	..	..	ngūgh wanyu-
Cook	..	..	..	thung-
Cool	..	..	..	libu, litām
Cooly	..	..	..	ung-kān-ik
Copulate	..	..	..	ne-, neyu-
Cord	..	..	..	lūgh
Core	..	..	..	yāk
Corn	..	..	..	shaubu
Corner	..	..	..	koh (external), nongbu (in- ternal)
Corpse	..	..	..	haibu-māng, māng
Cost	..	..	..	shangabu <sup>1</sup>
Costly, be, <i>vb.</i>	..	..	..	nam sek-
Cotton	..	..	..	pamba
Cover, <i>vb.</i>	..	..	..	tika kailep-
Cover, <i>n.</i>	..	..	..	kapchin
Covet	..	..	..	tūgh- ( <i>l.p.</i> ) <sup>2</sup>
Cough, <i>v.</i>	..	..	..	ngoku shāt- (=to have a cough); ngo shāk- (=to give a cough)

<sup>1</sup> Strictly an adjective—*e.g.* lating shangabu="how much (does it) cost?"

<sup>2</sup> *N.B.*—Tūgh- (*h.p.*)=to bubble, spring (of water).

Count	..	..	..	wie-, vwie
Counterfeit	..	..	..	shuo <sup>1</sup> ; long
Country	..	..	..	gautak; yam (uninhabited area)
Courageous, be ( <i>vb.</i> )	..	..	..	mangpon yang-, mang yang-
Cousin,	..	..	..	on male side—see “brother” “sister”; on female side nyāngē, which is also used as a form of address between persons of clans which can inter-marry
Cow	..	..	..	masu
Cowherd	..	..	..	masusambo
Coward	..	..	..	hättamkok
Coy	..	..	..	hīmōmăt (coy person, noun)
Crab	..	..	..	hin
Crab-apple	..	..	..	shangpi
Crack	..	..	..	phändätpu ( <i>i.e.</i> broken place)
Crazy	..	..	..	ngobu
Creeper	..	..	..	lügh, leügh
Crimson	..	..	..	säklambu; aibu säklambu (lit. very red)
Cripple	..	..	..	sohkibu
Crooked	..	..	..	kōmatpu, kōmpu; ngeitok-pu (hunch backed, stooping)
Crop (of bird)	..	..	..	huan
Cross, ( <i>vb.</i> )	..	..	..	tān-( <i>i.e.</i> go beyond)
Cross-bow	..	..	..	lau
Crow, <i>n.</i>	..	..	..	aukumatpa
Crow, <i>vb.</i>	..	..	..	kō-
Cock-crow	..	..	..	aunak-kōjin
Cry, <i>v.</i>	..	..	..	hāp-(neg. ihāp-)
Cubit	..	..	..	yikho, ( <i>N.B.</i> —4 yikho=1 pak, the span of a man's out-stretched arms)
Cunning	..	..	..	māngkok
Cup	..	..	..	pāngtēthung, thung
Cure, <i>v.</i>	..	..	..	maishoko kām-
Current	..	..	..	teilu
Custom	..	..	..	song
Cut, <i>v.</i>	..	..	..	wāb-; ak- (neg. ü'ak-or eāk of large trees only); nīn-, (cut up—of meat only); chām-(of meat only,=to cut up very small)

<sup>1</sup> Primarily of a rice husk that contains no grain, so of a man who will not work and of a counterfeit coin, *etc.*



## D

Daft	..	..	..	ngobu
Daily	..	..	..	thatke-thatke, thakke-thak- ke.
Dam, <i>n.</i>	..	..	..	thangatpu
Dam, <i>v.</i>	..	..	..	thangat-
Damp	..	..	..	rampu
Dance	..	..	..	sai; tum- (combined with singing)
Dao	..	..	..	in
Dark	..	..	..	naktübu, naktabu.
Daughter	..	..	..	yaksa-shou
Dawn	..	..	..	ngeyang
Day	..	..	..	chālo, chāro, chābük, nyet <sup>1</sup>
Daybreak, at	..	..	..	chānyu pāmjini
Daylight	..	..	..	nisakpu ( <i>adj.</i> )
Day and night	..	..	..	chālo-nangnak
Dazzle, <i>vb.</i>	..	..	..	nyek kiti-
Dazzled, be, <i>vb.</i>	..	..	..	nyek ki-
Dead	..	..	..	haibu
Deaf	..	..	..	obu
Deaf, be, ( <i>vb.</i> )	..	..	..	o- (neg- oō-)
Deaf man	..	..	..	obang
Debility	..	..	..	inyebu, inyetam ( <i>adj.</i> )
Deep	..	..	..	haulangbu, haughbu
Deer	..	..	..	meishi (barking deer), sāk (sambhar)
Delay, ( <i>vb.</i> )	..	..	..	[yāgh=serow, goat, antelope]
Delirious, be ( <i>vb.</i> )	..	..	..	pai-
Demon	..	..	..	mang shet-
Den	..	..	..	gaukabu mūghka (earth spirit)
Descend	..	..	..	kānyet
Desire	..	..	..	yān-
Destiny	..	..	..	mangsūgh- ( <i>v. supra</i> p. 23)
Detour	..	..	..	mūgh; thu
Dew	..	..	..	nongchung ( <i>advb.</i> )
Dhān	..	..	..	nīn
	..	..	..	shaubu of grain reaped threshed and stored; yōshō (of grain in the field)
Diarrhœa, have, ( <i>vb.</i> )	..	..	..	sīsak sän-
Die, <i>v.</i>	..	..	..	hai- (neg. ühei- or ihei-)
Difficult	..	..	..	siek

<sup>1</sup> Nyet is used with words implying number *e.g.*, lating nyet=how many days? (or chalo lating? or both may be used together *e.g.* chabuk lating nyet?), and with numerals *e.g.* chabuk ni nyet=2 days, chabuk sām nyet=3 days (but chabuk nyet chie=1 day).

Dig, <i>v.</i>	..	..	..	thu-
Directly	..	..	..	hali ; thongti
Dirty	..	..	..	māk
Discord	..	..	..	ôyō-phetyu
Disgusted, be, ( <i>vb.</i> )	..	..	..	mangsān-
Dish	..	..	..	chāk
Distinct	..	..	..	saupūtām
Ditch	..	..	..	kōklōkkan ; shumou
Dive, <i>v.</i>	..	..	..	(teito) sīto āt- (neg. iīt-)
Divide, <i>v.</i>	..	..	..	jān-
Divorce, <i>v.</i>	..	..	..	pāng-
Divorcee	..	..	..	abibu
Dizziness	..	..	..	tengmangmang, [ <i>e.g.</i> ngo tengmangmang aba- "I am dizzy" (ab-, neg. iīb-, = throw)]
Do, <i>v.</i>	..	..	..	kām- (of work generally)
Dobashi	..	..	..	ngūghbu
Dog	..	..	..	kei ; (wild) shuo
Domestic animals	..	..	..	sāmkei-sāmuk (lit. domestic dog, domestic pig)
Door	..	..	..	kōkāp
Door-way	..	..	..	kōkān
Dove	..	..	..	tukūtuk
Dowry	..	..	..	peisile (lit. 'things')
Drag, <i>v.</i>	..	..	..	sān-
Dream	..	..	..	mang ; mangalibu (=some- thing dreamt; manga happe = saw in a dream, mang lite = had a dream)
Dregs	..	..	..	ishing (lit. = liquor anus)
Dress	..	..	..	hele (ornaments) ; neisimei (clothes)
Drink, <i>v.</i>	..	..	..	yung-
Drink, give to, <i>vb.</i>	..	..	..	īn- (neg. iīn-)
Drive, <i>v.</i>	..	..	..	shi-
Droll	..	..	..	nila chānke (= it is laughable)
Drop, <i>v. (intr.)</i>	..	..	..	āt- (neg. u'āt-, e'āt- ; trans. atti)
Drown, <i>v.</i>	..	..	..	(teia) shāmāt-
Drowsy, be, ( <i>vb.</i> )	..	..	..	ngāk-
Drunk	..	..	..	chākatpu
Drunk be, get, ( <i>vb.</i> )	..	..	..	chākāt
Dry	..	..	..	limbu
Duck (domestic)	..	..	..	phatak
Dumb	..	..	..	ngūgh nangbu ; (ngobu, = 'idiot,' is also used)

## D

Dung	..	..	..	săt
Dust	..	..	..	thāmnăt
Dwarf	..	..	..	săttonġ
Dwell, (v.)	..	..	..	ki-
Dye	..	..	..	wailluġh (red, madder); pi (blue, indigo); nomphăt, (yellow); mūġhsak (black)
Dysentery	..	..	..	sisak; be ill of dysentery= sisak săn-

## E

Each	..	..	..	chie chie
Ear	..	..	..	nou
Earwig	..	..	..	kansung-mēsik
Early	..	..	..	nġeyang
Earring	..	..	..	kipchi
Earth	..	..	..	ġan, kau
Earthquake	..	..	..	sūlu; verb—sūlu ni-
East	..	..	..	chāng
Easy	..	..	..	sōbu
Easy, be, (vb.)	..	..	..	sō-
Eat	..	..	..	shau-; sau- (of rice when "rice" is not mentioned)
Eaves	..	..	..	chāmsō; kaumei (lit. 'earth- tail')
Echo, n.	..	..	..	nġuġhchu
Echo, (vb.)	..	..	..	nġuġh chu-
Eclipsed be, vb.	..	..	..	chanyu (or litnyu as case may be) -to saunyue shau-, lit. "tiger eats"
Edge	..	..	..	thuūn
Effigy	..	..	..	măt kămpu (lit. 'man made')
Egg	..	..	..	au-tei <sup>1</sup>
Elbow	..	..	..	yikkūk
Elder	..	..	..	jaishou
Elephant	..	..	..	thūnyū
Elsewhere	..	..	..	lobuto
Embankment	..	..	..	kaushong
Embrace	..	..	..	yik-e pamat-
Empty, adj.	..	..	..	kongbu
Empty, vb.	..	..	..	kong-
Enclose, Encircle, v.	..	..	..	kaichām-

<sup>1</sup> lit. "hen-water" cf. a-tui in Thado, chi-le-tha in Southern Sang tam, thevu-dzū in Angami, onotsū in Lhota, an-tsū in Ao with precisely the same meaning, perhaps reminiscent of a time when eggs were always eaten raw. In Sema, however, instead of awuzū as one would expect by analogy, we find awukhu.

End	..	..	..	thuün
Endeavour, <i>v.</i>	..	..	..	kāman chügh- (neg. not in ordinary use)
Enemy	..	..	..	lapo, labo
Enlarge, <i>v.</i>	..	..	..	yangti
Enough!	..	..	..	khü'ai
Enter, <i>v.</i>	..	..	..	āt- (neg. ü'üt- or iit.)
Entice	..	..	..	sülang
Envy, ( <i>vb.</i> )	..	..	..	tügh- ( <i>l.p.</i> , cf. 'covet')
Epilepsy	..	..	..	langat shāt
Epileptic, be ( <i>vb.</i> )	..	..	..	langat ang- (neg. ü'ang- )
Equal	..	..	..	hīm (of persons); chetei (of things)
Erect	..	..	..	tangshēbu
Escape, <i>v.</i>	..	..	..	sāt-, sātan-
Evening	..	..	..	jāsām, chāsām
Ever	..	..	..	pompento
Every one	..	..	..	pento
Everywhere	..	..	..	pento-a
Evil, <i>adj.</i>	..	..	..	amaibu
Exact, <i>adj.</i>	..	..	..	mai
Exaggerate	..	..	..	ngügh ha- (neg. uha-)
Except	..	..	..	apiyan
Excess	..	..	..	phōpan
Exchange	..	..	..	cheyu-
Expend, <i>v.</i>	..	..	..	sāk-, sākti-
Expensive, be ( <i>vb.</i> )	..	..	..	sēk-
Explain, <i>v.</i>	..	..	..	len-
Eye	..	..	..	nyek
Eyeball	..	..	..	nyeklang
Eyebrow	..	..	..	nyekkung
Eyelash	..	..	..	nyekwi
Eyelid	..	..	..	nyekkop

## F

Face	..	..	..	thēsinyek, thēnyāk
Fall	..	..	..	āt (neg. e-üt-, u-āt-)
False, speak	..	..	..	yep-
Falsehood	..	..	..	amlang
Family	..	..	..	nasho-yākṣa (see also 'kindred')
Fan	..	..	..	wānyep
Far	..	..	..	sābu
Fast	..	..	..	kānküthām
Fasten	..	..	..	kāp-, kīn-
Fat	..	..	..	hābu <sup>1</sup>

<sup>1</sup> Also metaphorical, e.g. ngügh-hābu="fat in words" i.e. one who exaggerates.

Fat, <i>n.</i>	..	..	..	hābu
Fate	..	..	..	mūgh-ka (lit. ablative case of mūgh, but used as a noun)
Father	..	..	..	apou
Father-in-law	..	..	..	akou
Fatigue	..	..	..	khū
Favour, show, <i>vb.</i>	..	..	..	sāno-
Fear	..	..	..	hāt- (neg. uhut-, ehit-)
Feast, ( <i>vb.</i> trans.)	..	..	..	ōknin- (neg. ōknin-)
Feather	..	..	..	auwi
Feeble	..	..	..	hai-nyangbu
Feed, <i>v.</i> (tr.)	..	..	..	pangti; auk- (neg. ôk-)
Feel, <i>v.</i>	..	..	..	pām-, pāmti-
Fell, (trees) <i>v.</i>	..	..	..	akan kōti-
Female	..	..	..	-nyu
Fence	..	..	..	pa ( <i>low pitch</i> ) <sup>1</sup>
Fern	..	..	..	ēkyang
Festival	..	..	..	lām <sup>2</sup>
Fetch, <i>v.</i>	..	..	..	hawan sungba-
Fever	..	..	..	māngpôk
Few	..	..	..	shishōkō
Field	..	..	..	siek
Fierce, be	..	..	..	māngsāk yem- (yem- lit.= "grow")
Fig	..	..	..	phok (large); tāt (medium); sātcho (small).
Fight	..	..	..	jāk- (make war); wapyu suyu- (fight with weapons); ngāmyu- (fight with non-lethal weapons, riot); ōyu-, neg. ōyu- (quarrel).
Fill	..	..	..	shenko chin-
Fin	..	..	..	ngauebu kāk (pectoral), chōngkāk (dorsal).
Find	..	..	..	hāp- (neg. uhūp-, ihip-)
Fine, <i>n.</i>	..	..	..	nāmshau
Finger	..	..	..	yikchishou
Finish, <i>vb.</i>	..	..	..	kām pām-, wan-
Fire, <i>n.</i>	..	..	..	wàn
Fire, <i>vb.</i>	..	..	..	wàne thie-, wàn sǎp-, (set fire to); [namthung] kib- (fire [a gun])
Fire-brand	..	..	..	wàntāt (both literal and metaph.)
Fire-fly	..	..	..	thengthou
Fire-place <sup>3</sup>	..	..	..	hokchang, haukchang

<sup>1</sup> Pa (*h. p.*)=red thread.<sup>2</sup> Also="small."<sup>3</sup> Made of stones. The stone by itself is called *hok* in this capacity.

Fire-stick	..	..	..	wànsong
Firm	..	..	..	kānkütham
First, <i>adj.</i>	..	..	..	shāngbu
First-born	..	..	..	jaishōpō (m.), nōshōnyu (f.)
Fish, <i>n.</i>	..	..	..	ngau
Fish, <i>v.</i>	..	..	..	(ngau) yăgh-
Fisherman	..	..	..	(ngau) yăgh-măt
Fish-hook	..	..	..	(ngau) yăgh-chin
Fishing-rod	..	..	..	(ngau) yăgh-chu
Fist, close, <i>vb.</i>	..	..	..	yik sām- (used also of numb- ness)
Fix, <i>v.</i>	..	..	..	kūgh-
Flame	..	..	..	wànlōng, lōng
Flat	..	..	..	shelibu
Flattened	..	..	..	shelitham
Flay	..	..	..	ang- (neg. ũang-)
Flee	..	..	..	sāt-
Flesh	..	..	..	phie
Flint and steel	..	..	..	wànkūgh
Floor	..	..	..	shuan : (if not raised—gau)
Flower	..	..	..	puan (bud); chiben.
Fly, <i>n.</i>	..	..	..	meisho
Fly, <i>v.</i>	..	..	..	pi-; pilang-, pijung sāt- (fly away)
Foam	..	..	..	ôkchôk
Fog	..	..	..	sangmei
Fold, <i>v.</i>	..	..	..	nôb-
Follow, <i>v.</i>	..	..	..	-paito hau- (neg. oho-)
Food and drink	..	..	..	shaula-yungla-bu
Fool	..	..	..	ngobu
Foot	..	..	..	yō, yō-năkshang
Foot-path	..	..	..	lām, mătmei-lam (Naga path)
Foot-print	..	..	..	yômô
Footstep	..	..	..	yo-yagh
For	..	..	..	-la, -shanga
Forbid, <i>v.</i>	..	..	..	khām-
Forcible	..	..	..	hau-kibu (lit.=muscle re- maining one)
Forcibly	..	..	..	hăghnyuko
Ford	..	..	..	teikatchăng
Forefathers	..	..	..	pisipo; piapoa (in the time of one's forefathers)
Forefingers	..	..	..	yikchishou shangpo
Forehead	..	..	..	khüngchā
Forest	..	..	..	lāmăng (see also 'jungle')
Forget	..	..	..	mā-
Forgive, <i>v.</i>	..	..	..	appu-sano- (neg. ippu- -asano-);

Fork	..	..	..	(po-) phék (of a tree or path)
Formerly	..	..	..	mētshāngāt; shāngāt
Forsake, <i>v.</i>	..	..	..	liti-
Fort	..	..	..	wātsūkpāmang
Fortunate, be ( <i>vb.</i> )	..	..	..	hāgh- (neg. ūhagh-)
Foul	..	..	..	māk
Fowl	..	..	..	aunāk
Frequently	..	..	..	pompento, pombento
Fresh	..	..	..	sāngtengbu
Friend	..	..	..	thangbo; chena (in address only; = "my friend")
Frighten, <i>v.</i>	..	..	..	hätti- (< hāt = fear, q. v.)
Frog	..	..	..	yūk
Front	..	..	..	tetang
Froth	..	..	..	ōkchōk
Fruit	..	..	..	pohek
Fruit-stone	..	..	..	pohek-lang
Fuel	..	..	..	pu
Full	..	..	..	shenko
Full-moon	..	..	..	kamteng
Fundament	..	..	..	shingkāt
Fungus	..	..	..	(pulo) nyingashik

## G

Gad-fly	..	..	..	ausāp
Gain	..	..	..	ai (the verb used with ai is lot-)
Gale	..	..	..	yeilang (lit. = "wind-rain")
Game (object of chase)	..	..	..	mēi (of fourfooted game only)
Game (of play)	..	..	..	lūghyōh
Garden	..	..	..	phamang, bā
Garlic	..	..	..	lāsung
Gate	..	..	..	kōkǎn
Gather, <i>v.</i>	..	..	..	pakpa- (of wood, flowers, or anything broken), keiba- (of fruit)
Generation	..	..	..	mātān
'Genna' be, ( <i>vb.</i> )	..	..	..	nno- <sup>1</sup>
'Genna' (= forbidden)	..	..	..	shala
Get, <i>v.</i>	..	..	..	hāp- (neg. ūhūp-, ihip)
Ghost	..	..	..	mūghka (seen in daylight—really a sky spirit); sou (seen in dreams, a phantom of the dead)
Gift	..	..	..	chongsāk

<sup>1</sup> The word for a festival or ceremony is lām.



Ginger	..	..	..	ssi
Girl	..	..	..	mătei
Give, <i>v.</i>	..	..	..	ku- (reflex. Imperat. lăpu)
Glad	..	..	..	ōlin- (neg. oōlin-)
Glass	..	..	..	lāmang
Gloom	..	..	..	naktüghtam (in day time); chijimomo (at night)
Glow-worm	..	..	..	thengdo
Gnat	..	..	..	kangsung-yōlō
Gnaw, <i>v.</i>	..	..	..	hit- (neg. ihit-)
Go, <i>v.</i>	..	..	..	hau-
Go!	..	..	..	ko!
Goat	..	..	..	luăn
Gong	..	..	..	lă
Good	..	..	..	maibu
Good fortune, have, <i>vb.</i>	..	..	..	hăgh- (neg. ühügh-), mugh- ka mai- (neg. amai-)
Goods	..	..	..	pēsilei
Gourd	..	..	..	chăppăt
Granary	..	..	..	püng
Grandparent	..	..	..	pī
Grandchild	..	..	..	shi
Grass	..	..	..	hănychăm, phăt, sang
Grass-hopper	..	..	..	koksing
Grasp	..	..	..	hat- (neg. uhüt-)
Gratis	..	..	..	āmlăng
Grave, <i>n.</i>	..	..	..	hetangchu
Grease	..	..	..	hăbu
Great	..	..	..	yangbu
Green	..	..	..	sangtingbu
Grief	..	..	..	manğto shatbu
Grind, <i>v.</i>	..	..	..	ngăn-
Groan	..	..	..	wi-
Ground	..	..	..	gau-, kau-
Grow	..	..	..	ching- (used both literally and of interest on loans, etc.)
Growl	..	..	..	wi-
Guest	..	..	..	yempo
Gun	..	..	..	nāmthung
Gunpowder	..	..	..	nāmthung-phăt; kar

## H

Habit	..	..	..	song
Hail, <i>vb.</i> ( <i>i.e.</i> full, of hail,)	..	..	..	lotă
Hail, <i>n.</i>	..	..	..	sün
Hair	..	..	..	kulo (of the human head), uwi (of the human body and of animals)

Half	..	..	..	phei
Halfway	..	..	..	lamtho
Hammer	..	..	..	namchangchin ; lō sǎ t (= hammer of a gun)
Hand	..	..	..	yik
Handsome	..	..	..	chàn
Handle	..	..	..	singkāt
Hang up	..	..	..	antinfo (neg. ü'intinfo-)
Happy	..	..	..	olin
Hard	..	..	..	kankobu, sekokpu
Hardship	..	..	..	khū
Harelipped	..	..	..	sampung-pheichobu
Harvest time, at	..	..	..	yosholatjini, yolatjini
Hat	..	..	..	khūn
Hatch, v.	..	..	..	pāk- (of sitting in order to hatch). pāp- (of the actual moment of hatching out)
Hate, vb.	..	..	..	tang-
Hated	..	..	..	tangbu-lebu
Hawk	..	..	..	aulu
Head	..	..	..	khū
Headache	..	..	..	khū-shat
Healthy	..	..	..	ashat-anyabu
Hear, v.	..	..	..	tit-
Heart	..	..	..	mangbun
Hearth	..	..	..	haukchang
Hearthstone	..	..	..	hok
Heat, n.	..	..	..	lām
Heat, vb.	..	..	..	lām-
Heaven	..	..	..	mūgh ( <i>h.p.</i> )
Heavy	..	..	..	atcheitam
Heel	..	..	..	yōtām
Heir	..	..	..	pātpān, thampo-pātpān
Help, v.	..	..	..	thui-(reflex. imp. thu'ke or thuike), ying-
Hen	..	..	..	aunyu
Hence	..	..	..	haka
Hen-roost	..	..	..	aunak-pākshāng, aushoung, aunak-langshang
Herdsmen	..	..	..	shatto-namto-chūghpu
Here	..	..	..	hani
Hereafter	..	..	..	hopaiya
Hiccup	..	..	..	hūk
Hide, v. intr.	..	..	..	hu- (neg uhu-)
Hide, vb. tran.	..	..	..	huti-, hudin pu-
High	..	..	..	sōkpu
Hill	..	..	..	shong
Hip	..	..	..	phelo
Hit	..	..	..	ngam-; kūgh-(hit against,

				hit together); <b>chǎng</b> -(hit with fist); <b>hau</b> -(hit a mark, neg. <b>uhau</b> -)
Hither	..	..	..	<b>hato</b>
Hive	..	..	..	( <b>nau</b> ) <b>baubu</b>
Hoar-frost	..	..	..	<b>nindhu</b>
Hoe	..	..	..	<b>shāp</b> , <b>känn</b> (indigenous); <b>yōgǎn</b> (Ao); <b>kutarǎng</b> , <b>haung-shāp</b> (imported)
Hold	..	..	..	<b>chung-</b>
Hole	..	..	..	<b>khūnyet</b> , <b>khūnn</b>
Hollow, <i>n.</i>	..	..	..	<b>-koök</b> ( <i>e.g.</i> <b>gaukoök</b> =hollow in the ground)
Hollow, <i>be, vb.</i>	..	..	..	<b>kōk-</b>
Honest	..	..	..	<b>mangtangbu</b>
Honey,	..	..	..	<b>nautei</b>
Honeycomb	..	..	..	<b>nauhǎp</b>
Hoof	..	..	..	<b>ngôk</b> , <b>hāk</b>
Hook, <i>n.</i>	..	..	..	<b>pheklǎng</b>
Hop, <i>v.</i>	..	..	..	<b>yōsōng-</b>
Horn	..	..	..	<b>lǎng</b>
Hornet	..	..	..	<b>nauyang</b>
Horse	..	..	..	<b>kuri</b> , <b>kori</b>
Hot	..	..	..	<b>lamaitam</b> ; <b>lambu</b>
Hot season	..	..	..	<b>sulang</b>
House	..	..	..	<b>chǎm</b>
House-holder	..	..	..	<b>chǎmbapu</b>
How	..	..	..	<b>lai</b>
How long	..	..	..	<b>lǎlokji</b> (of time)
How large	..	..	..	<b>lǎtatpu</b>
How much	..	..	..	<b>lājuji</b>
How many	..	..	..	<b>lǎting</b>
How often	..	..	..	<b>lǎting-ni</b>
Humpbacked	..	..	..	<b>ngeitokbu</b>
Hundred	..	..	..	<b>saungau</b> ( <i>i.e.</i> "five score")
Hunger	..	..	..	<b>mūgh</b> ( <i>l.p.</i> )
Hungry, <i>be, vb.</i>	..	..	..	<b>mūghe hai-</b>
Hunt, <i>v.</i>	..	..	..	<b>shi-</b>
Hurricane	..	..	..	<b>yeinǎk</b>
Hurry	..	..	..	<b>hali kam-</b>
Hurt, <i>vb. intr.</i>	..	..	..	<b>phāt-</b>
Husband	..	..	..	<b>lau</b>
Husk	..	..	..	<b>ek</b>

## I

I	..	..	..	<b>ngô</b> (agentive <b>ngē</b> )
Idiot	..	..	..	<b>ngōbu</b>
Idle	..	..	..	<b>sôsōbu</b> ; <b>sôsôtam</b> ; <b>hau-lu-hauchepbu</b>

If	..	..	..	logoji
Ignite, <i>v.</i>	..	..	..	wan thei- ; wan sāt- (=make fire)
Ill, be, <i>vb.</i>	..	..	..	shāt-
Immediate	..	..	..	tou-hali
Immodest	..	..	..	ihimōbu
In	..	..	..	-a, -mang
Indian corn	..	..	..	hangī
Indigo	..	..	..	lām ( <i>L.p.</i> )
Infancy, in	..	..	..	nashō-tanga
Infant	..	..	..	nashō-hampishō
Inform, <i>v.</i>	..	..	..	len-, lenti-
Inhale	..	..	..	shīp-
Inherit, <i>v.</i>	..	..	..	phāt pān-
Inheritance	..	..	..	phāt (concrete noun)
Injure, <i>v.</i>	..	..	..	lelu tikwa- (neg. aleluti-)
Insane	..	..	..	langat angbu
Insect	..	..	..	yangsikōk
Instead of	..	..	..	-chela
Intellect	..	..	..	māngbun
Interest (on loans)	..	..	..	phōp
Intestine	..	..	..	sinak (great); silo (small)
Into	..	..	..	-mangto
Invert	..	..	..	kābe-
Iron	..	..	..	nām
Ivory	..	..	..	thunyuho ( <i>i.e.</i> , "elephant's tooth")

## J

Jail	..	..	..	langsānbu chām
Jaw	..	..	..	kaushang
Join, <i>v.</i>	..	..	..	sāpyu-, chapāt-
Joke, <i>vb.</i>	..	..	..	ekyu- (neg. ēēkyu-)
Juice	..	..	..	-tei
Jump, <i>v.</i>	..	..	..	ai (neg. üi-); pheklang ai- (of high jump as a sport); kaushong ai- (of long jump); niho ai- (jump over); tontām ai- (of standing jump); phaitontām ai- (of standing jump backwards)
Jungle	..	..	..	yam; lāmāng (virgin forest); syeng (thick tree and ekra jungle); syeng-yang thick tree jungle); kăpthū (thick low jungle)
Jungle-fowl	..	..	..	aukan

## K

Keep, <i>v.</i>	..	..	..	pho-
Kernel	..	..	..	mai
Kick, <i>v.</i>	..	..	..	kügh-
Kid	..	..	..	luen-shou
Kidneys	..	..	..	kie
Kill, <i>v.</i>	..	..	..	lāb- <sup>1</sup>
Kindred	..	..	..	thāmbo (on paternal side only)
Kind, be, <i>vb.</i>	..	..	..	sānō-
King	..	..	..	chōba
Kitten	..	..	..	tānila-shōshou
Knee	..	..	..	yökük
Knee-cap	..	..	..	uwīlik
Kneel, <i>v.</i>	..	..	..	yöküke thung-
Knife	..	..	..	inshou ( <i>i.e.</i> , "dao-child")
Knock-knee'd	..	..	..	yökük-papyubu
Knot, <i>vb.</i>	..	..	..	shen-
Knuckle	..	..	..	yikkük
Know, <i>v.</i>	..	..	..	min-, nye- (see also "learn")

## L

Labour	..	..	..	kāmsili
Lac	..	..	..	minsäktei, min-tei
Lad	..	..	..	mātei
Ladle	..	..	..	mēēkuh
Ladder	..	..	..	chūng
Lair	..	..	..	hāp
Lake	..	..	..	tīmsi, tim, sitangbo
Lame	..	..	..	sogēbu
Lamp	..	..	..	hāntin (lit.= "torch")
Land	..	..	..	gau, kau,
Land-mark	..	..	..	lei-lang
Land-slip	..	..	..	limbulak
Language	..	..	..	ngügh
Lap, <i>n.</i>	..	..	..	yōshi
Large	..	..	..	yangbu
Lass	..	..	..	mātei
Last, <i>adj.</i>	..	..	..	paibu
Laugh	..	..	..	nyi-
Law, go to, <i>vb.</i>	..	..	..	ngügh peyu- (lit.= "word ask")
Lay, <i>v.</i> (eggs)	..	..	..	(autei) tei-
Lay, <i>v.</i>	..	..	..	yeptian pu- (= "put lying")

<sup>1</sup> Lāb=kill and behead, (used of warfare). To cut or pierce with a dao=wāb-; cut or pierce with a spear=su-; cut or pierce with bow or gun=kípāt-.

Lazy	..	..	..	haulō-hauchepbu, sobu.
Leaf	..	..	..	lie
Lean, <i>adj.</i>	..	..	..	sūnglobu
Learn, <i>v.</i>	..	..	..	nye- (neg. ang-) <sup>1</sup>
Leather	..	..	..	khōwun, khoan, khôn, phekhoun
Leave, <i>vb.</i>	..	..	..	abi- (neg. ibi-)
Leg	..	..	..	you
Leech	..	..	..	wāt
Left-side	..	..	..	nānē
Lemon	..	..	..	chāmpān
Lend, <i>v.</i>	..	..	..	lōtku-, lōkku-, (reflex. imp. lōtpu, < lōt="borrow")
Leopard	..	..	..	kongkuh
Leprosy	..	..	..	imbuh
Liar	..	..	..	yēppēchawe
Lick, <i>v.</i>	..	..	..	se-
Lid	..	..	..	kāpchīn
Lie (speak falsely), <i>vb.</i>	..	..	..	yepē-
Lie-down	..	..	..	leng-
Life	..	..	..	hak
Lift, <i>v.</i>	..	..	..	yāgh-
Light, <i>adj.</i>	..	..	..	songokpu
Light, <i>n.</i>	..	..	..	nisaktam
Light, <i>vb.</i> (of lamp, fire, etc.)	..	..	..	chik-, chīg-
Lightning	..	..	..	lāngpun
Lip	..	..	..	sāmpungkop
Liquor	..	..	..	i
Listen	..	..	..	titko ki-
Litigant	..	..	..	ngūgh peyubu
Little	..	..	..	hambishō
Little-finger	..	..	..	yikchishō aghpo (or thōnpu)
Live, <i>vb.</i>	..	..	..	lāng-, langei-
Liver	..	..	..	sānmāng
Living	..	..	..	lang
Lizard	..	..	..	salimāng; su (house lizard), unang (flying lizard), litnyu- salimāng (sand lizard), salimāng-entei-kokpu ("blood sucker"; lit. "egg- thieving lizard")
Load, <i>n.</i>	..	..	..	uwan, oan, lām ( <i>h.p.</i> )
Loan	..	..	..	lōtpu
Lofty, <i>adj.</i>	..	..	..	sōkpu
Log	..	..	..	pūh, pōkung

<sup>1</sup> Nyi- (neg. anyi-), =to have sexual intercourse (of the male), when in the positive form is almost indistinguishable from nye-="learn" "know." *Of. the Biblical idiom.*

Long, <i>adj.</i>	..	..	..	lōbu ; sūng (of length as opposed to breadth)
Long, <i>how</i> .	..	..	..	lālokchi
Look, <i>vb.</i>	..	..	..	chūgh-
Looking-glass	..	..	..	māngto-chūghchin
Loose	..	..	..	ippu
Loss	..	..	..	mau-
Loss, suffer, <i>vb.</i>	..	..	..	kong-
Love, <i>vb.</i>	..	..	..	māngsūgh-
Louse	..	..	..	hāt, hēk
Low, <i>adj.</i>	..	..	..	kaubu
Luck	..	..	..	mūgh (mai, amai ; good, bad)
Luck, have, <i>vb.</i>	..	..	..	hagh-
Luggage	..	..	..	pēsilē
Lungs	..	..	..	sanglo-loshe

## M

Mad	..	..	..	lāngāt-angbu <sup>1</sup>
Maid	..	..	..	mātei
Make, <i>v.</i>	..	..	..	yāgh- ; kām-,
Male	..	..	..	pōsu (and v. infra "mate")
Man	..	..	..	māt
Mango	..	..	..	ānpong
Manure	..	..	..	sāt ; sāt-tei (liquid)
Many	..	..	..	chūng
Mark	..	..	..	shēnla-nyēla
Market	..	..	..	pai <sup>2</sup>
Married	..	..	..	chāmhapu
Marry	..	..	..	thulam- ; yāk ngā- (of a man ; lit. = 'wife call'), lau-lamla hau- (of a woman ; lit. = 'go to take a husband')
Marrow	..	..	..	hai
Marsh	..	..	..	tīm
Mat	..	..	..	āmnyu
Mate	..	..	..	pang (male, of a pair of animals), pi (female, of a pair of animals)
Match, (lucifer match, etc.).	..	..	..	wānsāt
Meal	..	..	..	shaula-yunglabu
Meal, take, <i>vb.</i>	..	..	..	shaua-yung- (neg. ashau-eyung-)
Meat	..	..	..	pheh
Medicine	..	..	..	mōli

<sup>1</sup> Usually taken to mean 'epileptic,' genuine insanity being rare among Nagas ; 'crazed,' 'idiot' = ngobu ; i-lāngāt = 'mad with drink.'

<sup>2</sup> An Ao Naga word.



Meet, <i>v.</i>	..	..	..	hăp- (neg. ühup-, ihip-); haghyuo-(neg ühüghyuo); shôkyu-
Melancholy	..	..	..	māng-maubu
Mend, <i>v.</i>	..	..	..	kāmāt-
Menses	..	..	..	shuksi ; yōpong (euphemistic)
Merchant	..	..	..	nāmsēmāt
Merciful	..	..	..	sānōbu
Message, give, <i>vb.</i>	..	..	..	ngügh lenti-
Metal	..	..	..	nām
Meteor	..	..	..	kāncholíchu-ātpu
Middle, <i>adj.</i>	..	..	..	chinyu
Midnight	..	..	..	mütü-ponga
Midday	..	..	..	jāji
Mildew	..	..	..	moanpungbu
Milk	..	..	..	sāntei
Mind, <i>n.</i>	..	..	..	māng
Mire	..	..	..	thimô
Mirror	..	..	..	māngchüghchin
Mischance	..	..	..	uhagh ; mügh amai
Miserly	..	..	..	mākāt-melapu <sup>1</sup>
Miss, <i>v.</i>	..	..	..	uhau- (neg. of hau=‘hit’)
Mist	..	..	..	sāngmei
Mistake, make, <i>vb.</i>	..	..	..	ma-
Mix	..	..	..	yeyu- (of liquids); sühyu-, kēyu- (of solids)
Moan, <i>v.</i>	..	..	..	wi-
Mock, <i>v.</i>	..	..	..	niyo-
Modest	..	..	..	himōbu
Mole, (animal)	..	..	..	ancho-whutang-yōmangkā-
Mole, (on skin)	..	..	..	phōtnāk
Mole-hill	..	..	..	somchu-onḡpu
Money	..	..	..	nām, hongnām, tāchik, sāmpok
Monkey	..	..	..	kushou-kumei (all sorts of monkeys); longkam ( <i>maca- cus arctoïdes</i> ), kumei ( <i>maca- cus assamensis</i> ) meisū ( <i>macacus rhesus</i> ), yuô (langur), ô (huluk)
Month	..	..	..	līt
Moon	..	..	..	litnyu new moon—(litnyu) towang; full moon—(litnyu) kām- theng; waning moon—(litnyu) sükyàn

<sup>1</sup> Makat-melapu sāt-tongke ippu = ‘a miser who doesn’t even throw dung away.’

More	..	..	..	chinyu
Morning	..	..	..	ngeyang
Mosquito	..	..	..	kāngsung-yōlo (lit. = "long legged" kāngsung)
Moth	..	..	..	phatuh-longpong; phatuh- chingtok (very big)
Mother	..	..	..	anyu
Mother-in-law	..	..	..	nī
Mountain	..	..	..	shong (a single hill or peak), kongshuwī (a range)
Mouth	..	..	..	sāmpung
Move, <i>v.</i>	..	..	..	kuk- (intr.); kukti- (trans.)
Much	..	..	..	chūng
Mud	..	..	..	thimo
Murder <sup>1</sup>	..	..	..	immāt (∠ in = <i>dao</i> māt = <i>fault</i> )
Murderer	..	..	..	immāt-happu
Mushroom	..	..	..	kauyangbun (∠ <i>gau</i> = <i>earth</i> , yang = big, puan = flower)
Muskrat	..	..	..	somcho
Moustaches	..	..	..	sāmpungwi
Mutter, <i>v.</i>	..	..	..	nyamnyam-
Muzzle, (of gun)	..	..	..	namtong-sāmpung

## N

Naga	..	..	..	mātmai <sup>2</sup>
Naked	..	..	..	mākkong (< māt, <i>man</i> , kōng, <i>alone</i> ) <sup>3</sup>
Name	..	..	..	nyen
Name, ( <i>vb.</i> )	..	..	..	nyenti-; nyen pong- (parti- cularly to name an enemy or hostile village which has been defeated)
Narrow	..	..	..	kippu
Navel	..	..	..	shūng; shūng-lūgh (=navel- string)
Near	..	..	..	nyangbu
Neck	..	..	..	ngām
Necklace	..	..	..	ngāmdhān (a necklace that is an heirloom; any sort of bead = yak)
Needle	..	..	..	nikku

<sup>1</sup> See also under "poisoning."

<sup>2</sup> Mātmai lit. = 'proper' or 'real man', cf. the expression used by the Berg-Damara of S.W. Africa "*hau-khoi*" = 'real man'. The Chang call all non-Nagas "*haong*", and regard any complexion other than coppery red as ugly, whether white or black.

<sup>3</sup> So also *gau-kong* = bare land.

Needy	..	..	..	shālību
Negligent	..	..	..	hau-lu-hauchapu
Neighbour	..	..	..	sàngchung; nyangbu-măt
Nephew, niece..	..	..	..	jaibu-shou (elder brother's child); noēbu-shou (elder sister's child); naibu-shou (child of younger brother or sister)
Nerve	..	..	..	hao
Nest	..	..	..	hăp
Net, (n)	..	..	..	tak (throw-net), chala (drag-net), kăng (landing-net)
Nettle	..	..	..	sěno
Never	..	..	..	latangkei a-....
News	..	..	..	ngügh
Niece, v. (nephew)				
Night	..	..	..	nangnăk; miyo (last night), thau (to-night), niyo to-morrow night)
Nipple	..	..	..	sănsămbung
Nit	..	..	..	hěk-tei
No	..	..	..	ügh; chi (=not so); tō (=don't do so); agi, aki (=is not)
Nobody	..	..	..	auke-agī
Nod, (vb.)	..	..	..	ku ngūm-
Noise	..	..	..	lămen
Noise, make, (vb.)	..	..	..	lămen-
None	..	..	..	aki (=there is not)
Nonsense	..	..	..	amnang
Noon	..	..	..	chaji
North	..	..	..	yungtang
Nose	..	..	..	kung
Nostril	..	..	..	kungkăn
Nothing	..	..	..	aike aki (there is nothing); āmlăng
Now	..	..	..	tou
Nowhere	..	..	..	langkei a-
Now-a-days	..	..	..	tounăp-mēnăp
Numerous	..	..	..	chūng

## O

Oath	..	..	..	auto-tămtō (lit. = "chicken earth" <sup>1</sup> )
Oath, undergo (vb.)	..	..	..	auto-tamto năt-
Obey	..	..	..	tīt-

<sup>1</sup> Because chickens are cut and earth eaten in oaths as to ownership of land.

Offal	..	..	..	shengsăt
Offence	..	..	..	măt
Offence, commit, ( <i>vb.</i> )	..	..	..	yepechau-
Offspring	..	..	..	shōshou
Often	..	..	..	pompento
Oil	..	..	..	dūtchi
Old	..	..	..	hangbu
Omen	..	..	..	pang
Omens, take, ( <i>vb.</i> )	..	..	..	pang li-
On	..	..	..	tīgă
Once	..	..	..	chiong
One	..	..	..	chie
Onion	..	..	..	lāsung (lit.=‘garlic’)
Only	..	..	..	chiong <sup>1</sup>
Open, ( <i>adj.</i> )	..	..	..	ipan
Open, <i>v.</i>	..	..	..	ip- (neg. iip-)
Opinion	..	..	..	mānga tām̄bu
Opportunity	..	..	..	kit
Or	..	..	..	si
Orange	..	..	..	chămpăn, aukochămpăn
Order, ( <i>n.</i> )	..	..	..	ngūghkăm
Order, <i>v.</i>	..	..	..	ngūghkăm ku-
Origin	..	..	..	pak
Origin, derive, ( <i>vb.</i> )	..	..	..	pak-
Ornaments	..	..	..	hele
Orphan	..	..	..	shochetshou
Other	..	..	..	lubu
Otter	..	..	..	lām ( <i>h.p.</i> )
Outside	..	..	..	tăng
Over	..	..	..	takphaini, takaini, takā (of horizontal position only) <sup>2</sup>
Overturn, <i>v.</i>	..	..	..	kape-
Owing to	..	..	..	shanga
Owl	..	..	..	okhongba
Own, ( <i>adj.</i> )	..	..	..	lulubu

## P

Paddy	..	..	..	youshou
Pain	..	..	..	khūgh
Pain, fail, ( <i>vb.</i> )	..	..	..	khūgh- (neg. ukhūgh-)
Painful, be	..	..	..	phut-
Paint, <i>v.</i>	..	..	..	tho-
Palatable	..	..	..	shaula maibu
Pale, <i>adj.</i>	..	..	..	thupai, thupaibu

<sup>1</sup> Chiong = ‘one only’ < chie = ‘one’ and -ong = ‘only’. Thus hăchiong = “only this,” pamma sām-ong = “only three”

<sup>2</sup> Thus tak (lit. = ‘back’) could not be used of trees, for instance, with which ku (= head) is used.

Pale, turn, ( <i>vb.</i> )	..	..	thu-
Palm (of hand)	..	..	yikmang
Panji	..	..	wüt
Pant, ( <i>vb.</i> )	..	..	hăk hin- (neg. ihin-)
Panting	..	..	hăkthôna
Paper	..	..	hong-lie (lit. = 'foreigner's leaf')
Paradise	..	..	müghka sang <sup>1</sup>
Parents	..	..	nyusipou <sup>2</sup>
Part	..	..	phējân
Pass, ( <i>vb.</i> )	..	..	tân-
Pat, <i>v.</i>	..	..	ïp- (neg. iïp-)
Path	..	..	lam ( <i>l.p.</i> ); mătmai-lam (Naga path), kauyagh-lam (bridle-path)
Pauper	..	..	shālikok
Pay, <i>n.</i>	..	..	iknām (daily wage), lītām (monthly wage)
Peach	..	..	(Haongebu) shongpi <sup>3</sup>
Peak	..	..	shong tokpu
Penis	..	..	nie
People	..	..	mătshoung
Perceive	..	..	hăp-
Perhaps	..	..	-lo <sup>4</sup> (enclitic to verb); yinglabu
Pheasant	..	..	aulak ('dorik' or 'kalij' pheasant); pongo (deo- dorik' or polyplectron); aungo ( <i>tragopan cerni-</i> <i>ornis</i> )
Pick, ( <i>vb.</i> )	..	..	kei-
Picture	..	..	măng
Piece	..	..	thou
Pierce	..	..	săp-
Pig	..	..	ok (or uk); ok lăklibu (as distinct from boar or sow)
Pigeon	..	..	chamo aunak; chamo ('green pigeon')
Pile, <i>n.</i>	..	..	sheang
Pile, ( <i>vb.</i> )	..	..	sheang sheang-
Pillage, ( <i>vb.</i> )	..	..	yik chăt-
Pillar	..	..	thaunyu
Pinch, ( <i>vb.</i> )	..	..	nyat-

<sup>1</sup> Pitched high. If pitched low sang, = undergrowth. The length of the a is intermediate between ä and â.

<sup>2</sup> = 'female and male'; inverted posinyu = 'husband and wife'.

<sup>3</sup> *Shongpi* by itself means the local peach now found wild, "Foreigner's peach" being the cultivated variety recently imported.

<sup>4</sup> Used in present or future time.

Pine tree	..	..	pusin
Pipe	..	..	tākkung
Pit, (natural)	..	..	kaukok
Pitfall	..	..	püng
Pity, <i>n.</i>	..	..	sano
Pity, ( <i>vb.</i> )	..	..	sano-
Place, ( <i>n.</i> )	..	..	kauwan
Place, ( <i>vb.</i> )	..	..	fu-
Placenta	..	..	sāmkung, ongchong
Plain, ( <i>n.</i> )	..	..	yuomang
Plains	..	..	Haongyam
Planet	..	..	kānyang <sup>1</sup>
Plank	..	..	wape
Plant	..	..	pu
Plantain	..	..	thongo
Plantation, (of trees)	..	..	pupung, pulāk
Plate	..	..	pau
Play, <i>v.</i>	..	..	lūghyô chaiyu-, lūghyôwa-
Please, ( <i>interjection</i> )	..	..	-no (suffixed to imperatives).
Please, ( <i>vb.</i> )	..	..	olin- (neg. oōlin-)
Pleasing	..	..	chan
Pledge	..	..	teyola
Pluck, (flowers, etc.)	..	..	pāk-
Pocket	..	..	pōp
Point	..	..	sāmpung
Poison, ( <i>n.</i> )	..	..	kompu; putei (for arrows); gōm
Poison, ( <i>vb.</i> )	..	..	kompu-
Poisoning	..	..	kommāt
Poisoner	..	..	kompu-māt
Pond	..	..	sitangbu
Pool, (of river)	..	..	si
Poor	..	..	shalibu
Porcupine	..	..	sān
Pork	..	..	ok-phe
Portrait	..	..	mang ( <i>h.p.</i> )
Pot	..	..	chāk
Potato	..	..	mokma
Potato, (sweet)	..	..	ketamchu
Pour	..	..	ye-
Powerful	..	..	kangbu; ngūghkām kangbu
Practise, <i>v.</i>	..	..	sou takti- <sup>2</sup>
Precaution, take, ( <i>vb.</i> )	..	..	māng sāng-
Precede	..	..	tetangto hau-

<sup>1</sup> A planet appearing close to the moon is called *kāntāk* = "fighting cat" because it appears to fight with the moon, jumping close up to it and then jumping away.

<sup>2</sup> Lit. = "make to do upon a likeness."

Precipice	..	..	..	lāk
Pregnant	..	..	..	shōkibu ; a m a i a y u n g b u (euphemistic)
Prepare	..	..	..	lamli- (of going) ; takti- (of doing)
Present (to a distinguished guest), <i>n.</i>	..	..	..	ōkti (lit. of a pig killed to feed a guest)
Press, <i>v.</i>	..	..	..	shang-
Pretty	..	..	..	chūghla maibu
Previously	..	..	..	shangāt
Prick, <i>v.</i>	..	..	..	săp-
Profit	..	..	..	ai
Prolific, <i>be</i> , ( <i>vb.</i> )	..	..	..	hā-
Promise, ( <i>vb.</i> )	..	..	..	thi-
Prompt	..	..	..	sapsapmembu, sapsikmēm- bu
Proper	..	..	..	mai
Property	..	..	..	chamchong-siekpai (real), peisile (personal)
Prosperous	..	..	..	keibu
Prostitute	..	..	..	chasasaza, chasasaza-lok- lok
Protect, <i>v.</i>	..	..	..	pit-
Protector	..	..	..	mătpitpu
Proud	..	..	..	māngatambu
Pull	..	..	..	chang-
Pumpkin	..	..	..	chilimo
Punish, <i>v.</i>	..	..	..	"saza" ku-
Puppy	..	..	..	keishou
Purchase, <i>v.</i>	..	..	..	cheg-
Pure	..	..	..	sauphobu
Purr, ( <i>vb.</i> )	..	..	..	ngak-
Purse	..	..	..	neilōp
Pursue, <i>v.</i>	..	..	..	shin satti-
Push, ( <i>vb.</i> )	..	..	..	chāng satti-
Put, <i>v.</i>	..	..	..	phu-
Put on (clothes)	..	..	..	ne
Putrid	..	..	..	nyagmbu

## Q

Quagmire	..	..	..	tim, thim
Quail, <i>n.</i>	..	..	..	yemo
Quake	..	..	..	nyaknyag-
Quarrel	..	..	..	ōyu-, ōyo-(neg. ōyu-, oōyo-)
Quarter	..	..	..	thou
Quench, <i>v.</i>	..	..	..	chuan-
Question	..	..	..	phebu ngūgh (lit. "asked word")



Quickly	..	..	..	hali
Quicksand	..	..	..	pätsangküngkäm
Quietly	..	..	..	sämmele

## R

Rafter	..	..	..	läkngo ; kekip
Rain	..	..	..	lang
Rain-bow	..	..	..	yibuk-shangchap <sup>1</sup> ; mili-shēn
Rains	..	..	..	sulang (as opposed to pwang 'the cold weather') <sup>2</sup>
Raise, <i>v.</i>	..	..	..	phon- (partially), bamon- (completely)
Rake	..	..	..	hausau
Ramble, <i>v.</i>	..	..	..	amlang pai-
Rape, ( <i>vb.</i> )	..	..	..	tōguseko shanglap-
Rapids	..	..	..	lieklek
Raspberry	..	..	..	pi (generic); nāngnyenāmpi
Rash, ( <i>n.</i> )	..	..	..	poplitshat
Rat	..	..	..	yibuk (generic); chāmpabu yibuk (house rat)
Rattle, ( <i>n.</i> )	..	..	..	hōkhōk, whohōk
Raw	..	..	..	sāngtingbu
Razor	..	..	..	kujin
Reach, <i>v.</i>	..	..	..	yik shing- (with arm)
Read, <i>v.</i>	..	..	..	(lie) ue (neg. awe-)
Ready, be, ( <i>vb.</i> )	..	..	..	lamle-; ham (neg. ühum-)
Rear	..	..	..	paini
Rebuke	..	..	..	hak-
Receive	..	..	..	li-
Recline, <i>v.</i>	..	..	..	yep-
Recognise, <i>v.</i>	..	..	..	shēn-
Recollect, <i>v.</i>	..	..	..	taman-
Rectify, <i>v.</i>	..	..	..	kamat-, yenti-
Red	..	..	..	sāklangbu
Redeem, <i>v.</i>	..	..	..	teyobu senga-
Reel, <i>n.</i>	..	..	..	lekinchin (of cotton); läpchin, kaichin
Reflect	..	..	..	manga tam-
Reflection	..	..	..	mang
Release, ( <i>vb.</i> )	..	..	..	senga-
Relish, ( <i>vb.</i> )	..	..	..	mūgh-
Remain, <i>v.</i>	..	..	..	ki-, tāmū ki-
Remainder	..	..	..	chōbu
Remember, <i>v.</i>	..	..	..	taman-
Remove	..	..	..	kuktí-

<sup>1</sup> Lit. = "mouse's loofa."<sup>2</sup> The Chang divide the year into two seasons.

Rent	..	..	..	pounam
Repair, <i>v.</i>	..	..	..	kamat-
Repeat	..	..	..	takei lau-
Report, (of a gun)	..	..	..	lang
Resin	..	..	..	punai
Rest, <i>v.</i>	..	..	..	hak so-
Return, <i>vb. intr.</i>	..	..	..	kăpean <sup>1</sup> (or kapeanyu) ngai-, kăpean <sup>1</sup> lo-ngai-, [Im- perat. k <sup>1</sup> . kangaya]
Revenge, ( <i>vb.</i> )	..	..	..	poklam- <sup>2</sup>
Revenue	..	..	..	alimelan
Revolve, ( <i>vb. tr.</i> )	..	..	..	kai-
Reward	..	..	..	chongsa
Rhinoceros	..	..	..	kaumang thunyu (lit. = the elephant in the earth)
Rhododendron	..	..	..	aungchi
Rice	..	..	..	āng; nyāk (cooked)
Rich	..	..	..	keibu, keibu yangbu
Right	..	..	..	mai (in all senses)
Rim	..	..	..	sămpung
Rind	..	..	..	shung
Ring, <i>n.</i>	..	..	..	yentōbu pān <sup>3</sup>
Rinse, <i>v.</i>	..	..	..	hōkan ap- (neg. h. üüp-)
Ripe	..	..	..	sămpu, libu
Ripen	..	..	..	li-, săm-
Rise, <i>v.</i>	..	..	..	lăksăb- (from recumbent posture); lo-, lu- (from sit- ting posture)
River	..	..	..	yungmang
Road	..	..	..	lam ( <i>l.p.</i> ); <sup>4</sup> kauyaghlam (bridle path)
Roar, <i>v.</i>	..	..	..	we-
Room	..	..	..	sangchimăng (porch), <sup>5</sup> chă- mang (main room), jakchun (pantry), mabungsi (ward- robe)
Rock	..	..	..	lăng
'Rohi'	..	..	..	nyăkitei
Roost	..	..	..	lăng-
Root	..	..	..	li
Rope	..	..	..	lūgh ( <i>h.p.</i> )

<sup>1</sup> Kăpean is only used of immediate return; otherwise it is omitted.

<sup>2</sup> Used of blood feuds.

<sup>3</sup> Yentobu="circular." There is no real word for 'ring' in Chang as the Changs do not wear rings.

<sup>4</sup> Lam is a Naga path as opposed to kauyaghlam, a bridle path dug out of the side of the hill and levelled.

<sup>5</sup> A separate room inside the porch or 'veranda' of the house is called shemchăng. See also under 'apartment.'

Rotten	..	..	..	nyaghbu
Rough	..	..	..	sātsāttam, toktok loghlok
Round, ( <i>adj.</i> )	..	..	..	pamsambu
Rub, <i>v.</i>	..	..	..	shô-
Rub hard, ( <i>vb.</i> )	..	..	..	tututti shô-
Rule, <i>n.</i>	..	..	..	song
Run, <i>v.</i>	..	..	..	lāng-
Rupee	..	..	..	nām, tāchik, sǎmpak
Rust, ( <i>n.</i> )	..	..	..	houng
Rust, ( <i>vb.</i> )	..	..	..	houng pau-

## S

Sack	..	..	..	nelōk
Sad	..	..	..	māngmaubu
Sago-palm	..	..	..	mei ; meinyu (edible), hǎp- mei (false)
Salary	..	..	..	litnam
Saliva	..	..	..	nyok
Salt	..	..	..	chām
Salute, <i>v.</i>	..	..	..	yik ku-
Same	..	..	..	chetei
Sand	..	..	..	pātsāng
Sandfly	..	..	..	chōttām
Sap	..	..	..	putei
Save, ( <i>vb.</i> )	..	..	..	langti-
Saw, <i>n.</i>	..	..	..	pulatchin
Say, <i>v.</i>	..	..	..	lau-
Scald,	..	..	..	tei au-
Scar	..	..	..	nali
Scatter, <i>v.</i>	..	..	..	titoke-hitoke shin sātti-
Scent, (hunting)	..	..	..	lāmkinda
Scold, <i>v.</i>	..	..	..	hak-
Scoop, <i>v.</i>	..	..	..	māng lai-
Scorch, <i>v.</i>	..	..	..	chōk-, kāng-
Scorpion	..	..	..	hinebupi (lit. 'the crab's mother' as in most Naga and Kuki tongues)
Scrape, <i>v.</i>	..	..	..	kāt-
Scratch, <i>v.</i>	..	..	..	nyik- ; phek-(of fowls, <i>etc.</i> scratching the ground)
Scream, <i>v.</i>	..	..	..	wi-
Search, <i>v.</i>	..	..	..	lām-
Seat	..	..	..	sātchang, kǎmsok
Second	..	..	..	aulangkago <sup>1</sup>

<sup>1</sup> Second of three; of more than three shangbu tankabu is used = "the one after the first." Of two only paibu = "the one after," "the last," would be used.

Security	..	..	..	teyola, sobu
See	..	..	..	hăp-(neg. ūhüp-, ihip-; also=meet with, get); chūgh-(=look at, examine)
Seed	..	..	..	lila
Seize, <i>v.</i>	..	..	..	sanat-
Seldom	..	..	..	chie chia, chia paia
Self	..	..	..	mătpambu, poshou
Sell, <i>v.</i>	..	..	..	yāk-
Send, <i>v.</i>	..	..	..	kuti-(of sending away from speaker), laputi-(of sending towards speaker)
Sense	..	..	..	song
Separate, <i>vb.</i>	..	..	..	chăn-(intr.); chānti-(trans.)
Sept	..	..	..	jămpăn
Serau, (capricorn)	..	..	..	yau
Servant	..	..	..	sambu; sambuyaibu (dero- gatory)
Set aside	..	..	..	pheijeni (or nongboa) po-
Set down	..	..	..	po-
Severe	..	..	..	sekpu-lakpu
Several	..	..	..	atchi
Sew, <i>v.</i>	..	..	..	shi-
Shade	..	..	..	yemikobu
Shadow	..	..	..	mang
Shake	..	..	..	hōk-(neg. uhuk-)
Shallow	..	..	..	pabebu
Shame	..	..	..	nimou
Share	..	..	..	phēchan
Sharp	..	..	..	ākpu
Shave, <i>v.</i>	..	..	..	khū shu-
Sheath	..	..	..	mobo
Sheep	..	..	..	Haongebu luăn, minkei luăn <sup>1</sup>
Shelf	..	..	..	wape
Shell	..	..	..	kôp (used of any hard cover- ing of animals or plants)
Shield	..	..	..	ayi
Shin	..	..	..	yōliku, yōkung
Shine, <i>v.</i>	..	..	..	mang sho-
Shiver	..	..	..	lūgh-
Shoe	..	..	..	ngok
Shoot, <i>v.</i>	..	..	..	kib-
Short	..	..	..	kamsebu (of stature); tubu
Shoulder	..	..	..	phākchô
Show, <i>vb.</i>	..	..	..	chūghti-
Shrivelled	..	..	..	kônchokpu

<sup>1</sup> i.e., "Foreigner's goat," "woolly goat."

Shut, <i>v.</i>	..	..	..	kap-
Sick, be, <i>vb.</i>	..	..	..	shāt- <sup>1</sup>
Side	..	..	..	lan; na
Sigh, <i>vb.</i>	..	..	..	hakthoun-
Silence	..	..	..	sammeli
Silver	..	..	..	sāmpak-nām
Simul (bombax) tree	..	..	..	lagh'an
Sing, <i>v.</i>	..	..	..	chiya lau-; tōm-(=sing and dance)
Single	..	..	..	chiong
Sink, <i>v.</i>	..	..	..	nyēmāt lang-
Sip, <i>v.</i>	..	..	..	sāmpung namti-
Sister	..	..	..	anou (elder), ana (younger)
Sister-in-law	..	..	..	penyu
Sit	..	..	..	sāt-
Site (of house)	..	..	..	chāmshang
Skin	..	..	..	khōn
Skull	..	..	..	khulu
Sky	..	..	..	mügh ( <i>h.p.</i> )
Slander	..	..	..	nyenchāt
Slave	..	..	..	au, mātāu ( <i>l.p.</i> )
Sleep, <i>v.</i>	..	..	..	nyiekāt shi- <sup>2</sup>
Sleepy, be, ( <i>vb.</i> )	..	..	..	ngak-
Slender	..	..	..	-lōshou (as enclitic, <i>e.g.</i> māt-lōshou a slender person; of living things only)
Slightly	..	..	..	amlangong
Slimy	..	..	..	lōklōkpū
Slip, <i>v.</i>	..	..	..	shekat-
Slippery	..	..	..	shēkchēkpū (of ground, <i>etc.</i> ; lōklōkpū (of <i>e.g.</i> things eaten)
Sloping	..	..	..	tōkshangan; anglek
Slowly	..	..	..	māngyāngsho, hangshogo
Slug	..	..	..	nyingkēkāptung
Sluggish	..	..	..	kitkai-mangyangbu
Smallpox	..	..	..	siangpō
Smell, <i>n.</i>	..	..	..	lām ( <i>l.p.</i> ; lām, <i>h.p.</i> , = 'load')
Smell, <i>vb.</i>	..	..	..	lām hi-(neg. ihi-)
Smile	..	..	..	sāmpung men-
Smoke, <i>n.</i>	..	..	..	wankūkh
Smoke, <i>v. tr.</i> (of tobacco)	..	..	..	[tākkung] yung-(of a pipe), [shigrit] muk-(of cigarette, <i>etc.</i> )
Smooth	..	..	..	loklok (in the sense of shiny, polished)

<sup>1</sup> *i.e.*, 'be ill'; for vomit *v. infra.*

<sup>2</sup> *yep*-="to lie down," whether asleep or otherwise, and so is often used where we should use the verb "to sleep."

Snail	..	..	..	nyingkēkāptung
Snake	..	..	..	pīnyu
Snare, <i>n.</i>	..	..	..	yōchāp, sung, tin, autin, ngāmchap
Snare, <i>v.</i>	..	..	..	tīnsuwet san-
Snatch	..	..	..	chāp-
Sneeze, <i>n.</i>	..	..	..	hatchi
Sneeze, <i>vb.</i>	..	..	..	hatchi shi-
Snipe	..	..	..	nāmkung-au
Snow	..	..	..	nindhu
Snore, <i>n.</i>	..	..	..	ngākngāk
Snore, <i>v.</i>	..	..	..	kongkāna wi-
So	..	..	..	hai, khwola
Soak, ( <i>vb. trans.</i> )	..	..	..	[tei-a] shām-
Soap	..	..	..	vwi, uwi
Socket	..	..	..	thōngtu
Soft	..	..	..	inyaibu
Soil, <i>n.</i>	..	..	..	thām
Soil, <i>v.</i>	..	..	..	māk langti-
Something	..	..	..	aichie
Sometimes	..	..	..	jiajia, chisūpai
Someone	..	..	..	auchie
Somewhat, ( <i>adv.</i> )	..	..	..	hanshogo
Son	..	..	..	shou
Song	..	..	..	chiya
Soon	..	..	..	hali
Sore, <i>n.</i>	..	..	..	mou
Sorrow	..	..	..	māngmau
Sound	..	..	..	lang
South	..	..	..	yungkūk
Sour	..	..	..	haicheppu
Sow, <i>n.</i>	..	..	..	oknyu
Sow, <i>v.</i>	..	..	..	kie-
Span, <i>n.</i>	..	..	..	yikām
Spare (of the body)	..	..	..	mātlōshou (n)
Spark, <i>n.</i>	..	..	..	wanlegh
Speak, <i>v.</i>	..	..	..	lau-
Spear	..	..	..	aubu
Spectacles	..	..	..	lāmang, nyekmang
Spider	..	..	..	keklek, kieklik
Spill, <i>v.</i>	..	..	..	āp- (neg, ip-)
Spin, <i>v.</i>	..	..	..	lei shik-
Spirit (god)	..	..	..	mūghka <sup>1</sup>
Spirit (drink)	..	..	..	lambu i
Spit, <i>v.</i>	..	..	..	[uyōk <sup>2</sup> ] tok-
Spittle	..	..	..	uyōk
Spleen	..	..	..	siek

<sup>1</sup> i.e., "from heaven."<sup>2</sup> sometimes ōk.

Split, <i>v.</i>	..	..	..	peinyin-
Spoil, <i>vb.</i>	..	..	..	lelutigu-
Spoon	..	..	..	nyaksok, peisek, shiklak
Spread out	..	..	..	im- (neg. iim-)
Spring (of water), <i>n.</i>	..	..	..	teikük
Spring, <i>v.</i>	..	..	..	toamtüm ai- (neg. iï-); tũgh- ( <i>h.p.</i> ), of water
Spring (season)	..	..	..	kílahékma, wàna-wànchik
Squirrel	..	..	..	kongí; kheí (great black squirrel); lǝók, nyang (fly- ing)
Squeeze, <i>v.</i>	..	..	..	nyat-
Stab, <i>v.</i>	..	..	..	hǎn- (neg. ühün-)
Stagger, <i>vb.</i>	..	..	..	thōngninyitām ki-
Stagnant	..	..	..	shuibu
Stalk, <i>n.</i>	..	..	..	pugung
Stamp, stamp on, <i>v.</i>	..	..	..	nák-
Stand, <i>v.</i>	..	..	..	luo-
Stand up, <i>vb.</i>	..	..	..	luo-
Star	..	..	..	kancholǝchu
Stare, <i>vb.</i>	..	..	..	sǎm-
Startle, <i>vb.</i>	..	..	..	mokti abi- ( <i>neg. iibi-</i> )
Steal	..	..	..	kok-
Steel	..	..	..	suan
Steep	..	..	..	shimpuk
Stick, <i>n.</i>	..	..	..	chu
Stile	..	..	..	tām
Sting, <i>n.</i>	..	..	..	lũgh ( <i>l.p.</i> )
Sting, <i>v.</i>	..	..	..	lũgh-e chün-
Stir, <i>v.</i>	..	..	..	seke-
Stock (of gun on cross-bow)	..	..	..	lausǎn
Stockade	..	..	..	wütsǎkpa
Stone	..	..	..	lang
Stomach	..	..	..	shiyang
Stoop	..	..	..	kǎp
Stop, <i>v.</i>	..	..	..	hai- ( <i>intrans.</i> ); haiti- ( <i>trans.</i> )
Storm	..	..	..	yeilang; yeilang-susuli; yeinǎk ( <i>very severe</i> )
Story	..	..	..	pongũgh-pingũgh <sup>1</sup>
Stout	..	..	..	minkei ( <i>lit. "woolly"</i> ) <sup>2</sup>
Stream	..	..	..	chuchó, chumang
Straight	..	..	..	tangshei
Straighten	..	..	..	tangshei-ti-
Stranger	..	..	..	yempu

<sup>1</sup> Lit. "Father-Mother-word."<sup>2</sup> minkei is the word for a long coated dog that can only hunt for a short time because it gets exhausted owing to the thickness of its coat. Hence applied to any fat or unwieldy person.



Straw	..	..	..	youkung
Strike, <i>v.</i>	..	..	..	ngām-
String	..	..	..	lūgh ( <i>h.p.</i> )
Strong	..	..	..	kāngkaibu, haukibu
Subject, <i>n.</i>	..	..	..	pānsiyen
Suck, <i>v.</i>	..	..	..	shāp-; shīp-
Sudden	..	..	..	mangtie
Sun	..	..	..	chanyu
Sunlight	..	..	..	chā
Sunrise, at,	..	..	..	chanyu angjini ( <i>or</i> pāmjini)
Sunset, at,	..	..	..	chanyu nāpjini
Sure	..	..	..	mai
Swallow, <i>n.</i>	..	..	..	lolengchang ( <i>generic</i> )
Swallow, <i>v.</i>	..	..	..	leang-, sui-
Swarm (of bees)	..	..	..	[nau] haksobu
Swear, <i>v.</i>	..	..	..	thiyu- <sup>1</sup>
Sweep, <i>v.</i>	..	..	..	gu-
Sweet	..	..	..	teishikpu-
Sweet-heart	..	..	..	tangpou ( <i>masc.</i> ), tangnyu ( <i>fem.</i> )
Swift, <i>adj.</i>	..	..	..	yausobu
Swim	..	..	..	tei it- ( <i>neg. it</i> )
Syphilis	..	..	..	haongin

## T

Tabu	..	..	..	shala
Tail	..	..	..	mei
Take	..	..	..	le-
Talk	..	..	..	ngūgh wānyu-
Tall	..	..	..	lōbu
Tame	..	..	..	sāmbu
Tank	..	..	..	sūi
Tapeworm	..	..	..	mit-thu
Taste, <i>v.</i>	..	..	..	chāp-
Tear (of the eye), <i>n.</i>	..	..	..	nyeksitei ( <i>lit.</i> ='eye-blood- water')
Tear, <i>v.</i>	..	..	..	chitnin-
Tears, shed, <i>vb.</i>	..	..	..	nyeksi ang-
Tell, <i>v.</i>	..	..	..	len-
Tempest	..	..	..	yeināk
Tent	..	..	..	neichām ( <i>lit.</i> ='cloth-house')
Terrible	..	..	..	mangsāk
Testicle	..	..	..	tām, tāmlang
Than	..	..	..	touchi
That	..	..	..	khwo

<sup>1</sup> thiyu=to swear verbally, autotam-to hau=to take a formal oath.

Thatch	..	..	..	lang
Then	..	..	..	kajini
There	..	..	..	khwonĭ, kanĭ
Therefore	..	..	..	khwola, hola, khwoĭ
They	..	..	..	hauan
Thick	..	..	..	yangbu
Thief	..	..	..	kokpu; ampakoklok (abus- ive)
Thigh	..	..	..	youshi
Thin	..	..	..	kôplinbu (of persons), peglebu (of materials)
Think	..	..	..	tām-
This	..	..	..	ho
Thing	..	..	..	pēsile
Third	..	..	..	sămpobu
Thirsty, be, <i>vb.</i>	..	..	..	tei la-
Thorn	..	..	..	chăk
Thou	..	..	..	nuo, nō
Thousand	..	..	..	sau-an-ngauni
Thread	..	..	..	lei
Through	..	..	..	chi, chito
Throw, <i>v.</i>	..	..	..	tig-
Throw away	..	..	..	ap- (neg. ip-)
Throw down, ( <i>lit.</i> )	..	..	..	tigan yanti-
Throw up, ( <i>lit.</i> )	..	..	..	tigan anti-
Thumb	..	..	..	yikpām
Thunder, <i>n.</i>	..	..	..	lōngmāk
Thunder, <i>vb.</i>	..	..	..	lōngmāk mak-
Thus	..	..	..	hai
Tickle	..	..	..	chăge chăge khi-
Tie, <i>vb.</i>	..	..	..	shen-
Tiger	..	..	..	sauyang; saunyu (generic)
Tigress	..	..	..	sauyangnyu
Tight	..	..	..	lūkti shembu; kăngkhūbu <sup>1</sup>
Tighten	..	..	..	lūkti shenti-; kangkhūti. <sup>1</sup>
Timber	..	..	..	wa
Tipsy	..	..	..	chăkchăkmăkmăkpu, chă- kătmăkătpu (abusive)
Tired	..	..	..	mangbu; khūshokpu.
Toad	..	..	..	yūknyék
Tobacco	..	..	..	masūn
To-day	..	..	..	thăt
Together	..	..	..	pănto
Toe	..	..	..	yōchishou
Tomb	..	..	..	hēshang
To-morrow	..	..	..	nyet

<sup>1</sup> The first of the two applies to things fastened by knotting, the second to things fastened by twisting.

Tongue	..	..	lishang
To-night	..	..	thau, thau nāngnāk.
Too	..	..	-ke
Too (much)	..	..	aibu
Tool	..	..	? insōbu (< in-si aubu, 'dao and spear')
Tooth	..	..	hau
Top, <i>n.</i> (the toy)	..	..	yān
Top, <i>n.</i>	..	..	khu
Top, on, <i>adv.</i>	..	..	khua
Topsy-turvy	..	..	sāpēsai
Torch	..	..	hāntin
Tortoise	..	..	seangtok
Touch, <i>v.</i>	..	..	mēti-
Track	..	..	yōmu
Trade	..	..	nāmsei
Transparent	..	..	sākteshoku
Trap, ( <i>lit.</i> )	..	..	punong
Travel	..	..	yento hau-
Traveller	..	..	wagomāt, yemmāt
Tree	..	..	pu
Tremble	..	..	nyāk-
Trench	..	..	phā, phākuk; teilam (=
			'water channel')
Triangular	..	..	shingsimbu
Tribe	..	..	khūnāk
Trigger (of gun or cross-bow)			lōphai
Trip, ( <i>v. tr.</i> )	..	..	kin-, kinan tōngti- (with leg or foot); luyam tōngti (by catching with hand or cord)
Trouble, get, <i>vb.</i>	..	..	shetti-
True	..	..	mai
Trumpet	..	..	puthung
Try, <i>v.</i>	..	..	kāmān chüg-
Tumble, <i>v.</i>	..	..	āt- (neg. ūāt-), tōng-
Turn, <i>v.</i>	..	..	lāp-
Turn round, ( <i>vb.</i> )	..	..	sāpe-
Twin	..	..	pōkpū, pōkpushou
Twist, <i>vb.</i>	..	..	kūgh-

## U

Ugly	..	..	achan
Unable, <i>adj.</i>	..	..	asūgh
Unable, be, <i>vb.</i>	..	..	asūgh-
Unawares	..	..	mangtie
Uncle	..	..	apo jaishopou (father's elder brother)

				apo nāshopou (father's younger brother)
				akou [jaishopou or nāshopou as the case may be] (mother's brother)
Unclean	..	..	..	mākpaubu (dirty); ashaubu '(uneatable); ametibu (un- touchable)
Uncover	..	..	..	ip- (neg. üp-)
Under	..	..	..	panga, pangto
Understand	..	..	..	manga shök-
Underwood	..	..	..	siyeng
Undo	..	..	..	sengku-
Undress, v.	..	..	..	(nei) seng-
Unequal, be, (vb.)	..	..	..	chētei aying-; ayen- (of soil, etc.)
Unfold	..	..	..	seng-
Ungrateful	..	..	..	[no word, ? because ingratitude unknown, or because grati- tude unknown?]
Unhappy, be, vb.	..	..	..	mang mau-
Unhealthy	..	..	..	amaibu
Unite	..	..	..	tangti-
Unripe, be, vb.	..	..	..	asām-, ali-
Unroll	..	..	..	seng-
Up	..	..	..	mügha
Upright	..	..	..	tängshitām lobu
Uproar, make, vb.	..	..	..	laman-
Urine	..	..	..	chēt
Urine, pass, vb.	..	..	..	chēt chet-

## V

Vagabond	..	..	..	sātpu-maibu ; shoungto (abusive)
Valley	..	..	..	gaukok
Valuable	..	..	..	sekpū
Vegetable	..	..	..	biekshik
Vein	..	..	..	hao, silügh <sup>1</sup>
Verdant	..	..	..	pusang
Very	..	..	..	aibu, aibo
Vex	..	..	..	kit chimti- <sup>2</sup>
Vigilant, be, (vb.)	..	..	..	nyek sang-
Vigorous	..	..	..	sēkok kangkobu

<sup>1</sup> Hao is really a nerve or tendon; silügh lit. means "blood-cord", obviously the correct word.

<sup>2</sup> A frequent expression is—

kit ta-chimti, ota chākta = 'don't worry me! I am getting deaf and drunk' (i.e. with your troublesome chatter).

Village	..	..	..	sāṅg
Virgin	..	..	..	mātei (=girl)
Voice	..	..	..	laṅg
Vomit	..	..	..	kin-, eok kinge-
Vulture	..	..	..	aulu-pheshaubu
Vulva	..	..	..	shūk

## W

Wade	..	..	..	teimangto pai-, teimang sham-
Wagtail	..	..	..	tāktāk au
Wages	..	..	..	litnām
Waist	..	..	..	shenchang
Wait	..	..	..	hai (neg. ihi), haiko sāt-
Wait!	..	..	..	tamu!
Wake, v.	..	..	..	pi- (intr.), piti- (tr.)
Walk, v.	..	..	..	pai-
Wall	..	..	..	kāmthang
Walnut	..	..	..	lakket
Want, v.	..	..	..	mangsūgh-
War, make, vb.	..	..	..	wāpyu-
Warm	..	..	..	lamaibu
Warrior	..	..	..	lākpu
Wash, v.	..	..	..	yu- (bathe), nyet- (wash the face), sāk (wash the hands, mouth, clothes, etc.)
Wasp	..	..	..	nau (generic)
Waste	..	..	..	se-; amlang ap- (neg. üap- or iip-)
Watch, n.	..	..	..	chanyupi <sup>1</sup> , chānyumang
Water	..	..	..	tei
Waterfall	..	..	..	teishālāk
Wax	..	..	..	naulāp
Way	..	..	..	lām (l. p.)
We	..	..	..	sānn (including person address- ed); kānn (excluding person addressed); sāji, kāsi (dual)
Weak	..	..	..	hainyangbu
Wear (clothes), vb.	..	..	..	ne-
Weave, vb.	..	..	..	(nei) tāk-
Web (of spider)	..	..	..	kieklikchām <sup>2</sup>
Weed	..	..	..	sang
Weep	..	..	..	hāp- (neg. uhāp-)
Weigh, v.	..	..	..	hawan chüg-

<sup>1</sup> Chanyupi = 'wife of the sun,' though the termination -nyu indicates the femininity of the sun herself. Chanyumang = 'sun's shadow.'

<sup>2</sup> = 'spider-house.'

Weir	..	..	..	chaishong, kāp
West	..	..	..	chànap
Wet	..	..	..	namlengtām, nambu
What	..	..	..	ai
Whatever	..	..	..	taghketage, haghbangtūgh khu
When	..	..	..	lātang
Whence	..	..	..	lāka
Where	..	..	..	launi
Which	..	..	..	lau
Whirlwind	..	..	..	yeināk
Whisper, in a, <i>adv.</i>	..	..	..	hubangsho
Whisper, <i>vb.</i>	..	..	..	hubangsho lau-
Whistle, <i>vb.</i>	..	..	..	sui lau-
White	..	..	..	thupaibu
White-ant	..	..	..	langshang; langō (winged)
White thread	..	..	..	leithu
Who	..	..	..	au
Why	..	..	..	aila
Wicked	..	..	..	lilisizibu
Wide	..	..	..	kāng
Widow	..	..	..	lātnyu
Widower	..	..	..	lāpou
Wife	..	..	..	yaksa, yak; chāmpabu <sup>1</sup>
Wild	..	..	..	yam, ushipang
Wild animals	..	..	..	meisi'ao
Wilful, be, <i>vb.</i>	..	..	..	tūkū-sēko kam-
Will	..	..	..	māng
Wind, <i>n.</i>	..	..	..	yei
Wind, <i>vb.</i>	..	..	..	kai-
Windbag	..	..	..	ngūgh-nyaibu (adj.)
Wing	..	..	..	kāk
Wink, <i>vb.</i>	..	..	..	nyek mu-; nyekphe mu- (with one eye only)
Winter	..	..	..	puang, kāmalegha
Wipe, <i>v.</i>	..	..	..	hām-, haman ap- (neg. iip-)
Wire, <i>n.</i>	..	..	..	nāmlūgh <sup>2</sup>
Wiry (of men)	..	..	..	matloshou
Wise	..	..	..	mangli-mangsang
Wish, <i>v.</i>	..	..	..	tām-, mangsūgh-
Witch	..	..	..	seibu
With	..	..	..	chāmpo, paito
Withered	..	..	..	limbu
Within	..	..	..	mang
Witness	..	..	..	hāppumāt, pilibumāt

<sup>1</sup> 'Your wife' = kābu yaksa, or kā-yak but not kābu yak, nor kā-yaksa. Chāmpabu = 'house-keeper,' literally.

<sup>2</sup> = iron creeper.

Woman	..	..	..	yaksa <sup>1</sup> ; nyukwa (elderly), paushinyu (old)
Womb	..	..	..	sām
Wonderful	..	..	..	mangpangbu
Wood	..	..	..	pu
Woodcock	..	..	..	nāmkung au
Woodpecker	..	..	..	pupāp au
Woolly	..	..	..	minkei (a noun primarily denoting the long-haired variety of Chang dog, but applied to other furry ani- mals also, as an adjective, and used derisively of fat persons)
Word	..	..	..	ngūgh
Work, <i>n.</i>	..	..	..	kamsilei
Work, <i>v.</i>	..	..	..	kam-
World	..	..	..	gautak
Worm	..	..	..	kingkin (earthworm); mit (of the intestines of man or animals)
Worm-wood	..	..	..	sāngtī
Worst	..	..	..	aibu amaibu
Wound, <i>n.</i>	..	..	..	lelu; mou (when no longer fresh); pheli
Wraith	..	..	..	mūghka <sup>2</sup>
Wrap, <i>v.</i>	..	..	..	shuo-
Wrestle, <i>v.</i>	..	..	..	khūyo-
Wrinkle	..	..	..	khônchōk, khoanchōk
Wrist	..	..	..	yikngāmshang (lit. "hand- neck")
Write, <i>v.</i>	..	..	..	thu-
Wrong	..	..	..	yēpē (false); hangusuku (in- verted); amai (bad)

## Y

Yam	..	..	..	kēthamchu
Yawn, <i>vb.</i>	..	..	..	sou sai- (lit.=ghost dance)
Year	..	..	..	puo
Yearly	..	..	..	puopua
Yellow	..	..	..	sāmcheibu

<sup>1</sup> The feminine terms for animals are occasionally used abusively, e.g.—*mātnyu*, 'female human' (*mātpang* 'male human') thus ranking the person addressed with the so-called "lower creatures."

<sup>2</sup> Wraiths of the living are regarded as spirits simulating the appearance of mortal men, and not as astral bodies of the persons thought to be seen. *Mūghka*='sky spirit' (lit. "sky-from").

Yes	..	..	..	hagh
Yesterday	..	..	..	miet
Young	..	..	..	heshou

## Z

Zephyr	..	..	..	yeisangshou
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## ADDENDA.

Alder	..	..	..	ningsa
Area (measures of)	..	..	..	2 thu = 1 noklam 2 noklam = 1 paile 2 paile = 1 siekpai ( <i>i.e.</i> a man's cultivation for one year) about 100 siekpai= 1 lijēt ( <i>N.B.</i> thu, noklam and paile only used of land actually under cultivation)
Autumn	..	..	..	saupān
Clever	..	..	..	mangsangbu
Cormorant	..	..	..	yungau
Cuckoo	..	..	..	kuku
Foreigner	..	..	..	haong
Flute	..	..	..	pithung
Gonorrhea	..	..	..	langyang, nishat
Hornbill	..	..	..	langi; pi'au; auyang
Hound (for hunting)	..	..	..	mēshikei
Hunter, huntsman	..	..	..	yamāt, mēshimāt
Jew's harp	..	..	..	kongkin
Madar tree ( <i>Erythrina</i> )	..	..	..	happung
Marten ( <i>mustela indica</i> )	..	..	..	lāt
Measles	..	..	..	sicho
Mithun	..	..	..	ngou (domestic, <i>bos frontalis</i> ); mūghka ngou (wild, <i>bos</i> <i>gaurus</i> )
Oak	..	..	..	yampu
Palm ( <i>livistona</i> )	..	..	..	lou
Pandanus ("screw pine")	..	..	..	wou
Partridge	..	..	..	aupi (bamboo partridge), auwat (hill partridge)
Python	..	..	..	pinyu-saume
Quiver, <i>n.</i>	..	..	..	lauchinkek (basket), lauchin- tung (bamboo; used for poisoned arrows)
Reach (arrive at, <i>vb.</i> )	..	..	..	sūgh-
Swine (wild)	..	..	..	meibam





## Head-dress of the Hill-Tribes of Assam.<sup>1</sup>

By PROVASH CHANDRA BASU.

The following study is based on the collection of the Ethnographical Gallery of the Indian Museum. In describing the head-dresses of the hill-tribes of Assam, I have divided them into two main divisions. The first includes the Abor, Mishmi, Daffa and the Hill Miris, whereas the latter comprises the Nagas and the rest of the hill tribes of Assam. I have done so because these two divisions are not only separated from each other geographically but are strikingly different in type. The classification given below is based mainly on morphological grounds wherein are dealt not only with the main typological differences but with the technique and texture as well.

The materials used for the construction of the headgears are bamboo, cane, palm and plantain leaves which are abundant in Assam. The first two are used in-basket-work and the last two as the filling material in the basket-work. Bamboo and cane are used for the foundation as well as for the weaving element. They are generally made into fine strips and are then woven in various patterns.

### THE CLASSIFICATION.<sup>2</sup>

#### *Group A.*

Our first group consists of the Abor, Mishmi, Daffa and Hill-Miri series. Here there are three kinds—the Caps, the Rain Shields and the Hats.

**THE CAPS:** The base of most of the caps is pyriform. There is no ring shaped cap in this region. Some caps are made of leather (*Mishmi 10, 11*), whereas others are made of cane. Of the latter sometimes the base is strengthened by canebands and in the rest there is a beak-like projection in front (*Hill Miri 1, 2, 3; Mishmi 8*).

The former can be classified as follows :—

(A) Of wrapped work.

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<sup>1</sup> Paper read before the Anthropological Section of the 15th Indian Science Congress, 1928.

<sup>2</sup> The numbers referred to (in italics) throughout the paper are those given to the specimens in the Ethnographic galleries of the Indian Museum.

- (a) Round topped and strengthened by cane bands on outer surface. Ornamented *Abor 6*, *Mishmi 7*.  
Not ornamented *Abor 7* (See Plate 1, Fig. 1).
- (b) Strengthened by cane bands on outer surface.  
Flat topped and ornamented *Abor 3*  
Round topped and ornamented *Daphla 11*.

(B) Openwork of hexagonal type, top conical, outer surface quadrangular with one angle narrowed out. The space between the two basketworks being filled with leaves of dyed grass and plantain, e.g., *Abor 5*.

THE RAIN SHIELDS : In shape it is but a large edition of *Abor 5*, the interspace being filled with plantain and palm leaves, e.g., *Abor 2*.

THE HATS : They can be sub-divided into two divisions :—

- (1) Base strengthened by caneband, flat topped, wrapped work, decorated with horn-bill head e.g., *Abor 9*, *Mishmi 9*.
- (2) Base not strengthened by cane band, wrapped work, e.g., *Hill Miri 4*.

#### Group B.

Our next group consists of the Nagas and other hill-tribes of Assam. Following the usual classification we have the Hats, the Rain Shields and other types.

THE CAPS : These can be divided into the following divisions :—

- (1) Ring shaped, e.g., *Naga 100*, *101*, (See Plate 3, Fig. 1) *102*.
- (2) Oval or circular base and conical top (Naga type).  
Of these some are covered with hide, and others are simply made of canework either twill (*Naga 2*, *3*, *4*, *5*, *6*, *7*, *9*, *17*, *18*, *19*, *20*, *21*, *23*, *24*, *25*, *28* vide Plate 1, Fig 2) or wickerwork (*Naga 8*).
- (3) Oval or circular base, top not conical, e.g., *Naga 27*, *1685*.
- (4) Caps made of cloth, e.g., *Khasi 10*, *10A*.

THE HATS : Here we have two special types.

- (1) *The Banpara Naga Hat*—It has three parts :—

- (a) The socket has a rounded top and is of oblique twill over two and under two in rhythm.
- (b) The basal ring is covered with bear's hair in front and cotton behind.
- (c) The platform.

- (2) *The New Gong Type*: The basketry is usually of fine strips of bamboo and rarely of cane. The

platform is rather sloping and is strengthened on both the surfaces with hexagonal openwork in alternate rhythm. The interspace being filled with palm leaves. The individual hats differ only in minor details and decoration—the latter in some cases being of exquisite pattern.

*New Gong* (7986, 7990, 7991, 7993, 7994) *Assam* (5791, 11010, 5078 *Goalpara*). *Kamrup* 2102 (*Cf. N.G.* 7993). 2101, 5144 (See Plate 3, Fig. 2).

RAIN SHIELDS: It can be divided under the following heads:—

1. *Umbrella-New Gong* 7992.
2. *Rain Cover*.

(a) Usual hexagonal openwork of fine caneslips on both the surfaces. The interspace being filled with palm leaves. The upper end is rounded—slightly below which there is a projection backwards.

I. The base is pyriform and the lower end pointed, *e.g., Khasi 9A/2008; 22A.*

II. The lower end is more reduced than (a) *e.g., Assam 1806, 1807.*

(b) The Cachar type: The lower end is straight and horizontal, the basketry is open checkerwork of straight type, the peripheral part being strengthened with bamboo bands. There is an outward projection, a little below the upper end due to the change in the direction of the weaving elements. A little below it a few bamboo bands pass downwards. The interspace being filled with leaves, *e.g., Cachar 5083.* (Vide Plate 2, Fig. 2 and 3.)

3. *Rain Shield for head only.*

(a) Base Oval—there are two eminences on the roof—one in front and another behind, where the roof meets the slopes in the anterior and posterior surfaces respectively. The basketry is coarse-checked plaiting of bamboo strips. The margin is strengthened by bamboo and cane bands, *e.g., Naga Hills 7250.*

(b) A circular hat. Basketry of the usual type—the same inner and outer hexagonal openworks of bamboo strips with only minor variations. These elements all cross in the centre where they present a beautiful radiating appearance. Near the periphery for about 3" horizontal strips of

bamboo are used as the weaving element. It is strengthened on the outer surface by three concentric bands of bamboo slips. So also on the inner aspect there are in addition to these, four bands of bamboo strips intersecting in the centre. Between the outer and inner basketwork are leaves of palm.

#### OTHER TYPES.

- (1) Crescents: These are surmounted with feathers and spokes in a radiating manner. Sometimes they are made of pith surmounted with fine spokes of bamboo and decorated with dyed woollen threads, *e.g.*, *Naga 93-95*.

New Gong type:—An almost circular ring made of cane covered with hair placed on a board made of straight twill work of bamboo strips, over two and under two in rhythm and covered with blue cloth—over which it is decorated with strips of cloth dyed red and triangular pieces of paper arranged in rows. From this radiate four splinters of bamboo over which are placed horn-bill feathers, *e.g.*, *New Gong 1673*.

- (2) Radiating spokes surmounted with hair fixed to a median stump.  
 (3) Turbans, *e.g.*, *Manipuri 16, Mikir 9, Garo 17, 97*.  
 (4) Metallic helmets, *e.g.*, *Lukhipur 7988, Assam 5498*.

#### GENERAL DESCRIPTION, MORPHOLOGY TECHNIQUE AND TEXTURE :—

##### . Group A.

From the above we find that the most common pattern of weaving among the Daphla, Hill Miri, Abor and Mishmi are the wrapped types. The foundation of this consists of stout cane bands and the weaving elements are fine cane slips. Wrapped work in the head gears is comparatively rare in the south—the only specimen that we have got from the latter region is a cane helmet (*Naga 1685*) from the Naga Hills. It is interesting to note that this specimen conforms more to the Abor and Mishmi type than to the usual Naga specimens. A special study of this type is important, because it may possibly throw some light on their affinities.

The wrapped work found in the Assam headgears is of two distinct types—in one case the adjacent weaving elements move in the same direction, whereas in the other case they move in the opposite directions. (See Plate 1, Fig. 3 and 6.)

In some cases, specially in the Indo-Tibetan region, the head gears are strengthened by strong bands of cane possibly to protect the head from the blows of the enemies and the base is generally pyriform in shape. (See Plate 1, Fig. 1.)

Another type of basketry is the common hexagonal open-work of cross wrapped pattern with the wefts parallel to each other and passing over and under the same alternate warps as in *Abor 6*, (See Plate 1, Fig. 4).

It should be mentioned here that we have got very few specimens of conical caps in the Indo-Tibetan border. The usual type of roof in this region being flattened or rounded whereas the conical form is one of the characteristics of the Naga type.

It is interesting to note that *Abor 2* (a rain hat) has some affinities with the Khasi rain-shield. Thus it is more or less pyriform in shape with the centre slightly raised. The periphery is strengthened with splinters of bamboo. The dorsal surface is strengthened by a starshaped radiating figure having five arms—one arm of which extends to the pointed extremity. The basketwork is as in *Abor 5*; the interspace being filled with palm leaves.

The beaked cap is a special feature of this region.

The specimens of hat from this region is rather scanty (*Hill Miri 4*) in our collection.

#### *Group B.*

The usual type of cap among the Nagas is the conical type, the roof of which is occasionally rounded. The common type of basketry is plaited twill over two and under in rhythm, sometimes over three and under three with rare occurrences of checker and wickerwork (*Naga 8*). We have got here a wealth of other types which have been mentioned under classification.

In some cases the cap presents midway between the base and the apex four knob-like projections—two in front and two behind placed on either side—due to the change in the direction of the cane work *Naga 2* (3030).

Among the Nagas we get a very characteristic type of twill work over three and under three in rhythm, e.g., *Naga 9* (4914) *Lhota* (See Plate 1, Fig. 5) and *Naga 4* (10477). Here the slips on the outer surface commence near the upper end and midway between the base and the apex they pass under cover of a row of slips which are arched in a semi-circular manner, under it in the rhythm described above and again emerging from under it near the lower border. At the lower part is a fine plaiting of cane which is kept in position by four longitudinal bands, two in the sagittal and two in the transverse diameters.

The usual Naga type of hat is already described in the classification.

Of the ring shaped caps *Naga 101* (1632), (Plate 3, Fig. 1) Banpara is an interesting type. This is made of cane

bands, being lined inside with arecanut spathe. In front there are two rows of white seeds—one along the upper border and another along the lower. In the centre there is a band of fine checkerwork of cane slips—of which the vertical rows are dyed whereas the horizontal rows are not dyed at all and in the centre as well as on the sides it is also decorated with white beads. In the upper and lower rows the white beads are fastened with black fibres possibly of palm. This is a type also met with among the Garos among whom it is used as a ceremonial head-dress with the only difference that in the case of the latter there are fine cane slips in the centre instead of being woven in checkerwork are wound in a spiral manner. Over the rows of white beads are added cock's and bhimraj feathers.

With the slow and gradual infiltration of the Hindu ideas a profound change has occurred in the head-dresses. Thus the Manipuris, the Mikirs, the Garos and the Khasis wear Turbans now-a-days. The Khasis also use caps made of cloth. Thus in *Khasi 10* we have a cap with no ear flaps and both surfaces being covered with white cloth. It is made of two halves sewn together in the median sagittal line—the rest of the sewing—all radiate from the median line. The interspace being filled with cotton. Again in *Khasi 10A.*, we have a blue cap with one ear flap on either side.

The next important type is the rain cover. It is more or less pyriform in shape, the upper end being rounded but gradually the lower end becomes reduced until it becomes perfectly straight and horizontal. The basketry is of usual hexagonal openwork and the interspace being filled with leaves. A variety of it being *Cachar 5083* (See Plate 2, Fig. 2 and 3)—(for description, see under classification)—a very interesting type. We find an exactly similar object being still in use among the Negritos of the Phillipine Islands (*Vide Manila Ethnographic Survey*, Vol. I, 1905, p. 122, Plates XLIV and CXXXIV).

The other interesting types are rain shields for head and body, rain shields for head only and circular hats. But the most important among all these is the characteristic New Gong type of hat. (For description see under classification). (See Plate 3, Fig. 2). It is found in New Gong, in Goalpara, in Kamrup, among the Shans of the Chin Hills (The living races of mankind p. 116—in the picture of a Shan beauty), among the Kachins (*Vide picture of Kachin girl in p. 173. Shakespear's History of Upper Assam*) and among the Karen Peoples of Burma (*Vide picture in p. 83 of Karen Peoples of Burma by Marshall 1922—on the head of a woman transplanting paddy*).



## DECORATION.

The head-dresses betray a wealth of decoration. The decoration is undoubtedly simple, mostly confined to the articles that they can easily secure. Head-dress is one of the very few things that marks the individual's position in their tribal life. But with the infiltration of modern civilization much of those ancient characteristics have been smoothed down but there still exist sufficient fossilized relics of the past to throw a flood of light not only on those inherent tendencies of their culture but also on the past records of their cultural history. Thus we find that the horn-bill feathers occupy a very important place in the primitive culture of Assam. They are put over the spokes of bamboo or seeds as among the Nagas, the Garos, etc., and are of much significance in that warriors have a right to wear them after they have taken human heads. Those who have not done so wear silky feathers of Burmese domestic fowl or some imitation feathers. And later they are worn one for each successive head taken. This feature is found not only among the primitive tribes of the Indo-Tibetan region but it is looked also with a very great regard among the primitive peoples of Malay, Borneo and other regions. The horn-bill head and horn-bill feathers are much used by the primitive inhabitants of the Indo-Tibetan region as a decoration for their caps and helmets (*Abor* 4, 8, *Mishmi* 7, etc.) as well as among the peoples of Northern Borneo.

They make an enormous use of the boar's tusks placing them in different positions so that the types of decoration vary in different head gears (*Abor* 3, 5, *Naga* 5, 7, etc.). (See Plate 1, Fig. 6.)

In some cases the posterior ends of the boar's tusks are inserted into plaited works of cane. It is interesting to note here that the boar's tusks are looked upon with high regard among the peoples of North Borneo.

These people profusely use animal hair mainly of pigs, deer and bears in ornamentation. In some cases simple hair is used, in others it is dyed red or black and in some it is attached to skin (*Daphla* 11, *Abor* 5, 6, *Naga* 6, 23, etc.). Sometimes the hair is fixed to a caneband so that its free end hangs freely in the air, in others it is fixed to a cane band curved so as to be crescentic in outline.

Among the Nagas sometimes fine strips of cane are taken from the upper end of cane slips. These hang down freely and as they are very light they move about freely with the breeze. (*Naga* 6). (See Plate 3, Fig. 3.)

Brass discs are greatly used by the Nagas. The disc is generally circular in shape with an aperture in the centre as in



*Naga 6*. But in other cases semi circular discs with perforations and metallic pieces of various shapes are used (*Naga 2, 6, 17*). Brass studs are used among the Garos (*Garos 97*).

The Nagas greatly use the crescents of buffalo horn as a decoration to their head gears *Naga 6, 18* (See Plate 3, Fig. 3). These are generally tipped with hair. It is interesting to note that the methune horn forms a very important part in the Naga culture. We also find in the culture of the Philippine Islanders—the two crescents in the forepart of the head as of the Nagas in the pictures of “Customs of the World” p. 655. Ifugao in N. Luzon in wedding dress, in Sawyers “Inhabitants of the Phillipines” (in the picture of Negrito) (Aeta) from Negros Island facing p. 207 also among the warlike Igorots as in the picture facing p. 254, of Igorot spearman and Negrito archer.

In some cases palm fibres are used in decorations. Thus in *Naga 3* (Banpara), a semicircular arch is placed on the right side of the top. The base of the arch is made of cane and from it radiate fine narrow needle-like projection possibly of palm fibres, at the free ends of which are tied small pieces of wool in some cases.

Feather occupies a very important place in decoration. The place of horn-bill feathers has already been noted—they are placed so loosely as to twirl in the wind. Sometimes they are fixed to central rachis. Thus in *Naga 3* many of the feathers are attached to the basket work in front and the rachis is made of twisted cane over which are fixed feathers by means of dark threads. The lower ones are small plumules, the upper ones being true feathers. In *Naga 4*, the tip of the crescent of buffalo horn is decorated with hair dyed red and black with feathers attached to it and a row of feathers is fixed to a cane-band in the posterior end. The method of fixing is peculiar. In the lowest part is a cane-band to which the lower ends of the plumules are bent on themselves. Then in the intermediate portion they are fixed by two cane strips.

Shell, wool and cowrie occupy a very conspicuous part in decoration. The last one is usually fixed but the first two generally hang as pendants (e.g., in *Naga 4*). In *Naga 93* coloured wool is used to keep the piths and the spokes of bamboo in position—some being attached radially, others concentrically. Dr. Hutton considers the conch-shells and the Cowries to be the relics of a waterborne culture (vide *The Assam and the Pacific* by J. H. Hutton, C.I.E., *Man in India*, Vol. IV, No. 1 and 2 p. 12).

The technique in weaving plays a no less important part in ornamentation as in *Naga 9* (Lhota). Sometimes all the cane-slips are dyed while one or two are not dyed or vice versa and it is by the combination of these elements that various patterns such as lozenges are produced; in other instances

slips are secondarily introduced over the non-coloured ones giving rise to new designs.

Running triangles and lozenges of paper are generally pasted overboards either of the crescents or of the platforms of the hats. Seeds as mentioned before are occasionally disposed in various patterns.

In some cases the head-dresses are decorated with strips of black or red dye.

In those places where turbans are worn much decoration is found in needle work and the wearing of the cloth itself as in *Manipuri 16*.

With the contact of modern civilization many new elements have entered in their decoration. Thus in *Naga 4* coloured beads of glass, clothes of various patterns, silver braids, scrolls, triangles, etc. (e.g., in *New Gong 7916*) are much used. Another profound change that has taken place in their culture is rather the decay of head hunting. Formerly human skulls were hung as a mark of bravery indicating the number of heads taken but this is now almost a dead letter.

In some places mica foils (e.g., in *Assam 11010*, *New Gong 7993* etc.) and palm leaves cut into triangles and buttons and are used as decoration.

#### CONCLUSION.

To sum up,—the study of Indian head-dresses is of much anthropological interest and as such deserves a careful attention. Those of the Indo-Tibetan region are distinct from the rest. So also we find the usual Naga cap to be of a definitely distinct type. But there are features sufficient to indicate that the Abor and Mishmi groups have their cultural affinities with the inhabitants of the Naga Hills and other hill-tribes of Assam. Again it should be remembered that there are a few special types among the former which we find nowhere else in our collection, e.g., the beaked caps.

The importance of horn-bill undoubtedly deserves notice. This we find common not only to the Abor and Mishmi region but also in the Malay Peninsula as well as among peoples of Northern Borneo. This possibly therefore is relic of a culture which these types of people have adopted from others or had in common with others.

A ring-shaped cap of cane lined on the inner surface with arecanut spathe and decorated with seeds fastened with black fibres of palm and with fine slips of cane is found to be common both among the Garos as well as among the Nagas. Added to this we might remark with Dr. Hutton that they have in common, "the erection of the Y shaped posts, the practice of reaping by hand," etc. (Introduction written by Dr. Hutton p. XXXVI of the *Lhota Nagas* by J. P. Mills, 1923).

The New Gong type of hat is the hat *par excellence* of the Assam Hills and Valley. It has been found in Goalpara, in Kamrup, among the Shans of the Chin Hills, in Sibsagar and among some of the Ao Nagas and the Karen peoples of Burma.

The Cachar type of rain cover has its exact copy among the primitive inhabitants of Manila. Added to this the cult of the horn, the use of crescents on either side of the forehead, resembling the buffalo horns, tipped with hair or feathers are common both to the inhabitants of the Naga Hills as well as to the Aeta Negrito of the Negros island, the warlike Igorots and other inhabitants of the Phillipine Islands.

Thus we find that what is true of the Abor, Mishmi, Naga, the Garos and the Malay Tribes is also true of the Nagas, the Cacharis and the inhabitants of Luzon. The affinities of the Nagas with the inhabitants of the Phillipine Islands have already been suggested by Dr. Hutton (vide Introduction written by Dr. Hutton, p. XXVI to the Lhota Nagas by J. P. Mills), and a study of the head-dresses of the hill-tribes of Assam leads to the same conclusion.

My thanks are due to Lt.-Col. R. B. Seymour Sewell, Director and Dr. B. S. Guha of the Zoological Survey for permission to use the collection of the Ethnographical Section of the Indian Museum. The work has been carried on under the directions of the latter to whom my special obligations are due.

## EXPLANATIONS TO PLATES.

## PLATE 1.

- Fig. 1. Abor Cane helmet.  
 Fig. 2. Common Naga twill plaiting.  
 Fig. 3. 2nd. type of wrapped weaving.  
 Fig. 4. Hexagonal pattern of weaving.  
 Fig. 5. Texture of  $\frac{\text{Naga 9}}{4914}$  Lhota (Ind. Mus.).  
 Fig. 6. Abor helmet. Abor 3 (Ind. Museum).  
 Below is shown the usual type of wrapped weaving, both turns being taken in the same direction.

## PLATE 2.

- Fig. 1. Texture of Naga 2 (Ind. Mus.), showing the abrupt change in the direction of weaving.  
 Fig. 2. Cachar type of Rain Cover.  
 Fig. 3. Technique of weaving in the Cachar type of Rain Cover.  
 Figs. 4 and 5. Decorations of feather. Those marked in cross are red.

## PLATE 3.

- Fig. 1. Naga  $\frac{101 (1632)}{\text{Banpara}}$  (Ind. Mus.) This type is also found among Garos.  
 Fig. 2. New Gong type of Rain Hat. Technique of weaving is hexagonal open work of alternate rhythm.  
 Fig. 3.  $\frac{\text{Naga 6 (9281)}}{\text{Tangkul}}$  (Ind. Mus.) Note the crescents of buffalo horn tipped with hair.

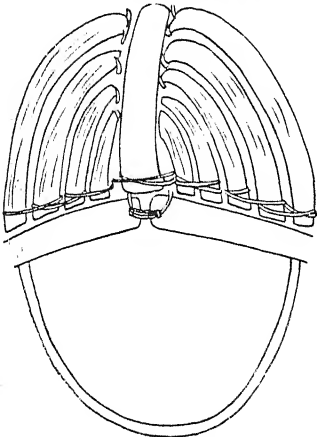
## PLATE 4.

- Fig. 1. Naga cap with crescents of buffalo horn on either side tipped with hair  $\frac{\text{Naga 6 (9281)}}{\text{Tangkul}}$  (Ind. Mus.)  
 Fig. 2. A Naga cap  $\frac{\text{Naga 9}}{4914}$  Lhota (Ind. Mus.). Note its peculiar texture.  
 Fig. 3. A Naga crescent worn on festive occasions Naga 93 (8825) (Ind. Mus.).  
 Fig. 4. An Abor cap decorated with hair and boar's tusks Abor 3 (1092) (Ind. Mus.).

PLATE. 5.

- Fig. 1. A Naga crescent decorated with feather worn on festive occasions.
- Fig. 2. A Hill Miri cap decorated with hair and skin. Hill Miri 4 (10907-1) (Ind. Mus.).
- Fig. 3. A Naga ringshaped cap decorated with beads and cane work. This cap closely resembles the Garo 14 (Ind. Mus.) <sup>Naga101 (1632)</sup> <sub>Banpara</sub> (Ind. Mus.).
- Fig. 4. A Mishmi helmet decorated with hornbill head. Mishmi 7 (1732) (Ind. Mus.).
-

Abor 7 (Ind. Mus.).



Cane helmet.  
Fig. 1.

Common Naga twill plaiting.

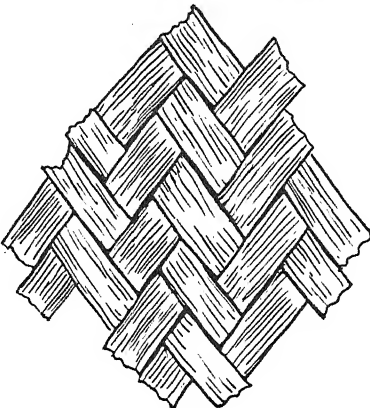
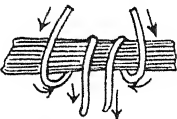
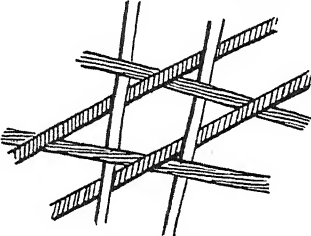


Fig. 2.  
Hexagonal pattern of weaving.

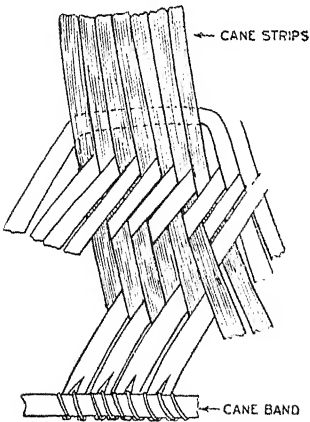
2nd type of wrapped weaving.



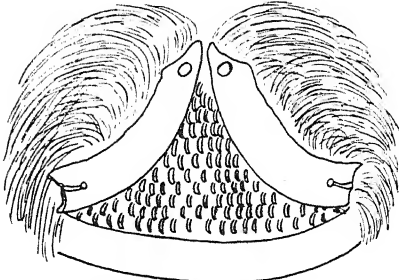
Turns in opposite direction.  
Fig. 3.



No. 10903 (Ind. Mus.).  
Fig. 4.



Texture of Naga 9 Lhota.  
No. 4914 (Ind. Mus.).  
Fig. 5.



Abor 3 (Ind. Mus.).  
No. 10902 (Ind. Mus.).

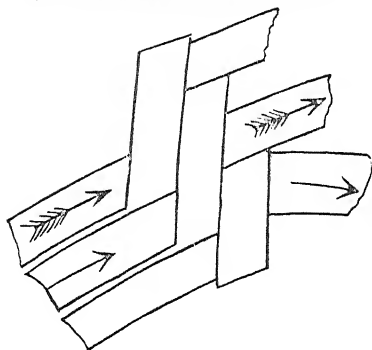
1st type  
of wrapped  
weaving.



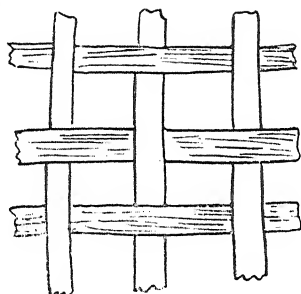
Both turns taken in the same direction.  
Fig. 6.



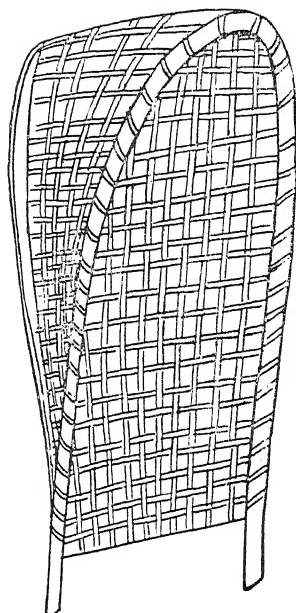
Texture of Naga 2 (Ind. Mus.).



Showing the abrupt change in the direction of weaving.  
Fig. 1.



Technique of weaving.  
Fig. 3.



Cachar type of Rain Cover.  
Fig. 2.

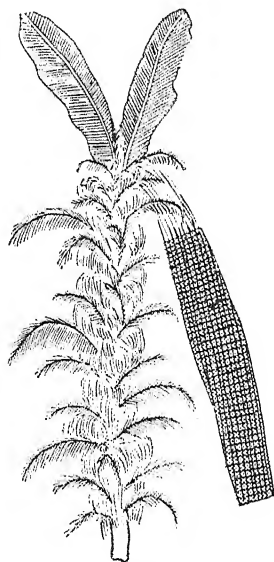


Fig. 4.

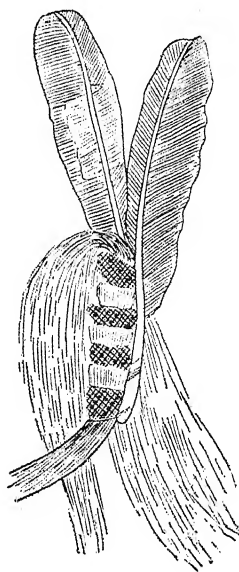


Fig. 5.





*Naga 101* (1632) (Ind. Mus.).  
(Banpara).

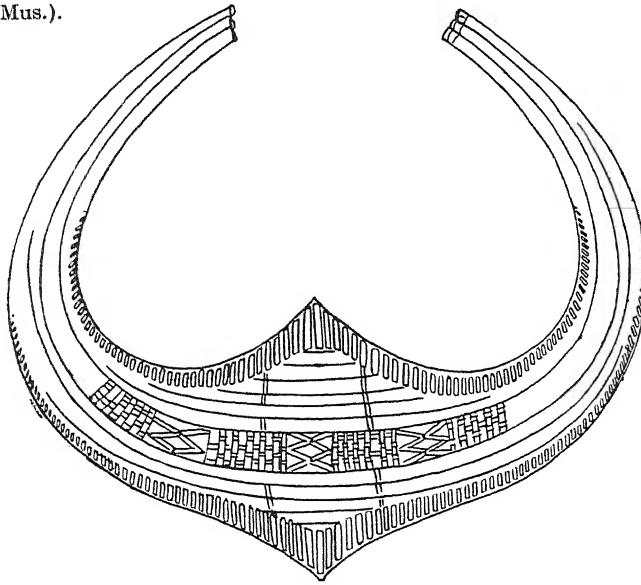
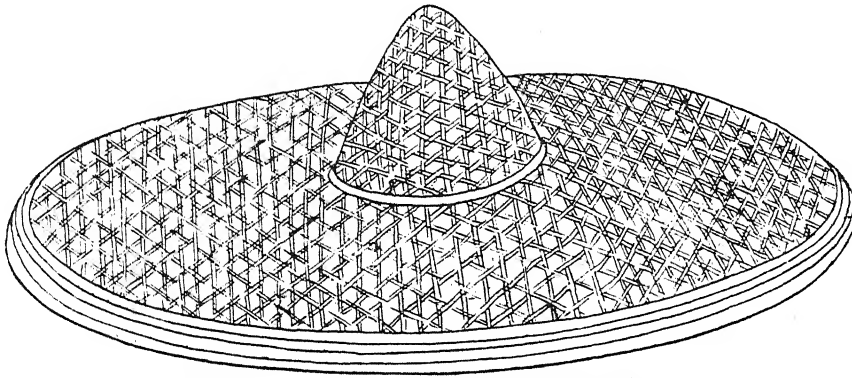


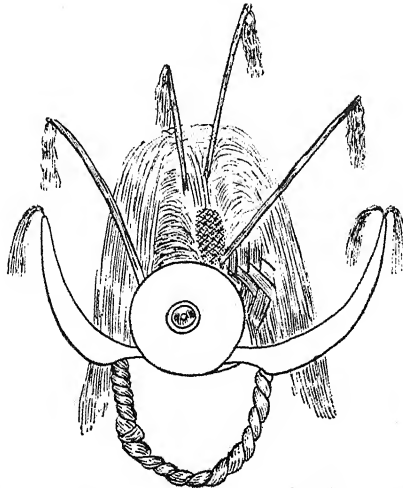
Fig. 1.



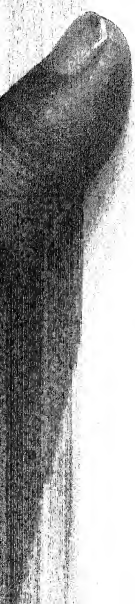
NEW GONG TYPE OF RAIN HAT.

Technique of weaving  
is hexagonal open work  
of alternate rhythm.

Fig. 2.



*Naga 6* (9281)  
*Tangkul.*  
(Ind. Mus.).  
Fig. 3.



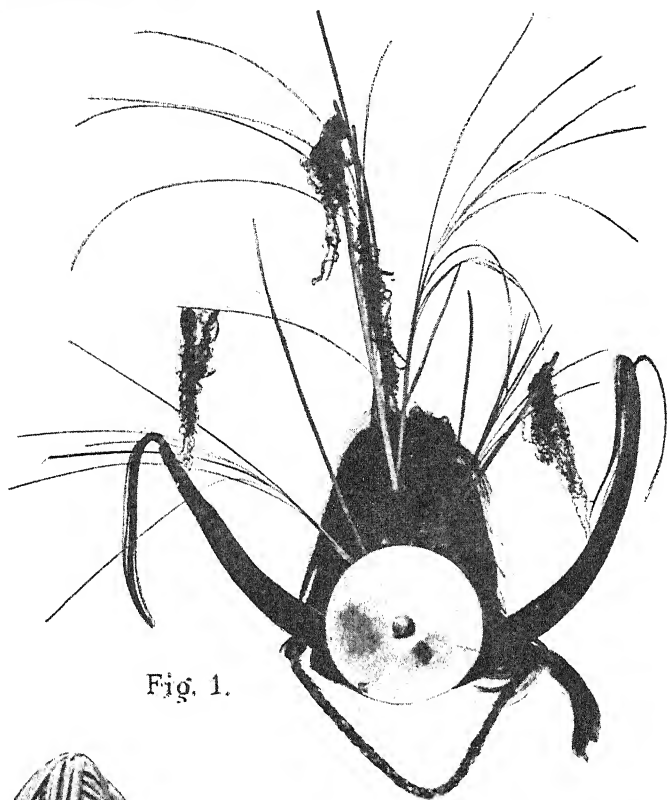


Fig. 1.

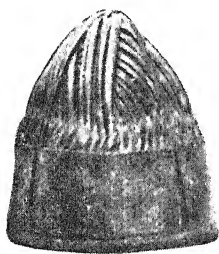


Fig. 2.

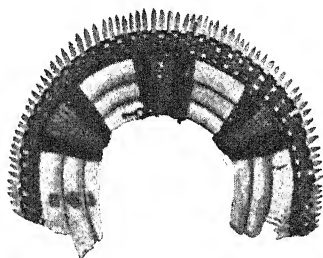
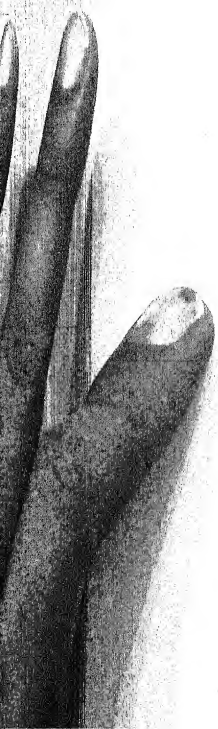


Fig. 3.



Fig. 4.



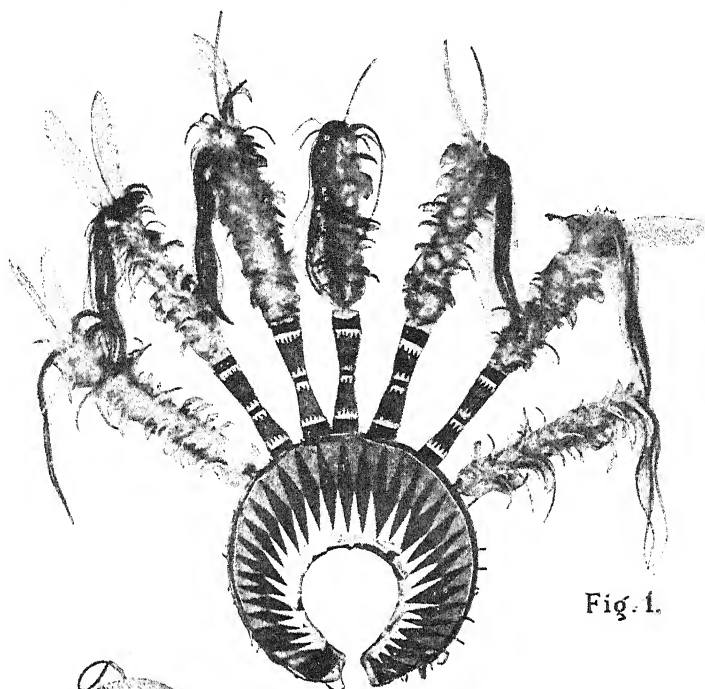


Fig. 1.

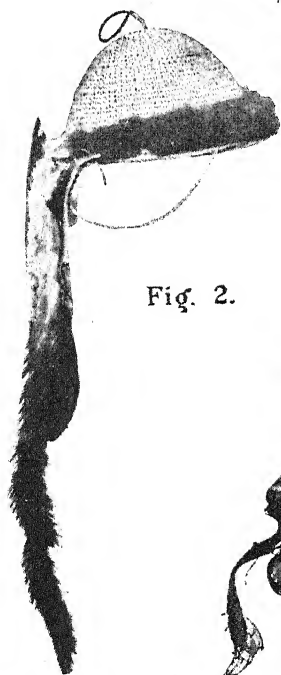


Fig. 2.

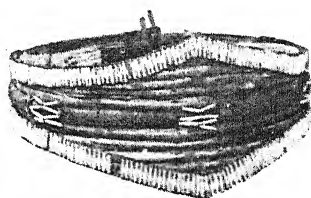


Fig. 3.

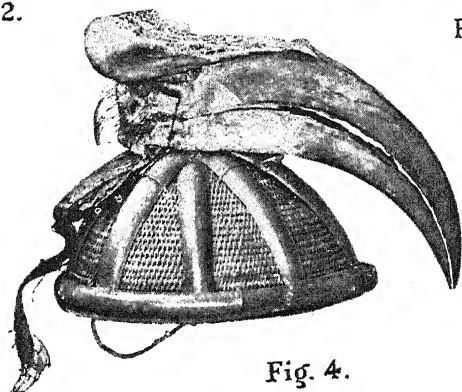


Fig. 4.



Originals and Parallels of Some Santal Folk Tales.

BY KALIPADA MITRA.

1. FOLKLORE OF THE SANTAL PARGANAS BY C. H. BOMPAS.

(DAVID NUTT, 1909.)

*Lita and his Animals* (pp. 87-97).

The youngest son, Lita, got from his father Rs. 60 to trade. The villagers were chasing a cat which stole milk from the house of the Raja. He purchased the cat for Rs. 20. Then he bought an otter, a rat, and a snake. The snake took him home and advised him to get from his father a ring which when placed in a seer of milk would produce anything whatever desired. He married a girl for whom with the help of the ring he made (for this was the condition) an underground passage between his and her father's house. Now Lita's wife had a paramour. She extracted the secret from her husband; and at night she drew off the ring from Lita's finger, and eloped with her paramour. Before they departed they killed a goat and sprinkled its blood on the floor. On the following morning, Lita was suspected to have murdered his wife, and was taken into custody. The animals came to Lita in prison and on his advice went out in quest of the missing ring. They reached a palace shining like gold on the other side of the Ganges. With the help of the otter they reached the palace. The rat bored a hole into the wall. Then he climbed on to her chest (while she was fast asleep by the side of her paramour) and tickled her nose with the tip of his tail; this made her sneeze and behold! she sneezed out the ring which she had hidden in her mouth. The rat ran off with it. While crossing the stream he was pounced upon by a kite and dropped the ring into the water. It was subsequently discovered by the otter to be lodged in the stomach of a fish which was hauled up. But a kite took the fish off which was subsequently recovered from some women (who snatched it from the kite) by the cat. The ring was then taken out and delivered to Lita in prison. The ring, commanded by Lita, transported the bed on which the guilty pair were sleeping to the presence of the magistrate who convinced of Lita's innocence released him from the prison.

*Cf. also story No. XXXIII. Ramai and his Animals,*  
*pp. 129-131.*

The youngest son bought a cat, a dog, an otter and a young black snake. The snake advised him to take nothing



from his father except a ring on his hand. "It is a magic ring and has the property that it will give you whatever you ask." He got from it a luncheon and then a gold palace.

A.—(*Parallel*). FOLK TALES OF KASHMIR BY THE  
REV. J. HINTON KNOWLES (London, Trübner & Co., 1888).

*The charmed Ring.*

A merchant gave his son Rs. 300 to trade. Apparently a fool he purchased a dog (for Rs. 100) whom some herdsmen were about to kill, and then a cat and a snake (who were likewise in the peril of their lives) for the remaining Rs. 200. His father angrily turned him out to the stables. The snake led him to his palace in a spring where he advised him to get from the snake-father, *Indrasharājā*, a *charmed ring* on speaking to which a beautiful furnished mansion and a charming lovely woman would be provided for him. He got also a *pot* and a *spoon* which would supply him with all manner of rarest and most delicious foods.

All this happened and he lived most happily with the woman for several years, 'until one morning the woman while arranging her toilet put the loose hairs into a hollow bit of reed and threw it into the river.' This was caught by a prince who ceased eating and drinking, and was pining away for the girl. His aunt—an ogress—became a bee and finding the girl out, got the ring and carried it to the Prince. He spoke to the ring and the mansion and the girl appeared before him. He wanted her to marry him. She prayed for a month's respite. Meanwhile the cat assured the merchant's son that he would find out the ring for him. He went to the palace, saw the lady unobserved and learnt from her that the ring was in the stomach of the ogress. As there was a marriage procession of the rats he pounced upon the rat bridegroom and promised to release him only if the rats gave him the ring. At midnight when the ogress was sound asleep, one of the rats climbed upon her face and inserted its tail into her throat, whereupon the ogress coughed and urged violently, so that the ring came out and rolled on the floor. The cat got it, mounted on the back of the dog and crossed the stream. The dog took it and dropped it into the water. A fish swallowed it. A cormorant caught the fish from which the ring was recovered. It was carried off again by a kite and ultimately restored to its owner.

B.—(*Parallel*). TALES OF THE PUNJAB  
BY MRS. FLORA A. STEEL.

*The wonderful Ring.*

The youngest prince purchases, each for a golden sovereign a cat, a dog, a parrot, and a snake. The snake-father, in

gratitude, gave him a *ring* which when sprinkled with butter-milk produced whatever was wished. He got delicious dishes from it, and with its help built a palace in the middle of the sea, and married a princess, who became golden by its virtue. She combed out some hairs which she let float down the stream. A prince caught them, and sent a wise woman in quest of the princess. She persuaded the princess to get the ring from her husband and brought her to the love sick prince, after having taken the ring from her. The spendthrift Prince's cat got hold of a rat and made it thrust its tail up the nose of the wise woman as she lay snoring with the ring in her mouth. As she sneezed the ring flew out of the mouth on the floor and was picked up by the parrot who brought it to the Prince. He got back his wife.

C.—(*Parallel*). FOLK TALES OF ORISSA BY U. DATTA GUPTA.

*Story of Ambujamani.*

The eldest son of a Merchant buys a parrot, a mongoose, an *Odha* 'water-cat' and a snake. The mother of the snake, the *Nāga-rānī*, gives him the magic gem *Ambujamani* which gives everything desired. A Raja through the agency of his daughter gets the gem; and it is recovered in the same way as in the Kashmiri and the Santali tale; the snake thrust his thin and tiny tail into the Raja's nostril and he coughed out the gem.

D.—(*Parallel*). INDIAN FOLK TALES BY G. MISRA.

*The Pearl.*

The same account of beasts purchased and thus saved from molestation. The mongoose picks up the ring, after it was recovered by the same old trick of the snake inserting its tail into the nose of the ogre which causes the ejaculation of the ring. The cat swam across the river, the snake rode upon it, and upon the latter the mongoose, while the parrot was flying overhead. The pearl drops into the water, whereupon the cat wishes the fish to find it out. It was found on a serpent. The parrot asks Garuda's help to recover the ring which is ultimately restored to its owner.

E.—(*Parallel*). FAIRY TALES FROM MANY LANDS.

(Gresham Publishing Co.)

*The Magic Ring.*

(P. 105). Here the rat got the ring. Cf. also the Gold-haired Princess in the stories above.

## F.—(Other Parallels).

Cf. Grimm's "*the Grateful Beasts*"; the *Saccamkira Jāt* (73), the *Babbu Jāt* (No. 137), the grateful Elephant (Jat No. 156), and the Vultures (No. 164) are not close parallels, but are only examples of gratefulness of animals. Cf. also *Ārāmasobhā and the grateful snake* in the *Kathākośa* (Tawney, trsln. 85ff.); Kaden, *Unter den olivenbäumen* ("Lichtmess") "*Rasavāhini; Jambudipa*" in the *Orientalist* (Nov. 1884); see Penzer "*Ocean of story*" Vol. I, p. 101; Vol. V. p. 157, also Burlingame's Colln. of Jat. tales. Cf. *The Feast of Fists in Orient Pearls*.

For the magical article—the charmed ring, see *Cing cents*, story No. 199 (jarre magique, t. II pp. 74-75); *Dadhivāhana Jātaka* (No. 186, razor-axe, drum, milk bowl, the wildboar's gem), *Bhadraghaṭa-Jāt* (No. 291)—the wishing cup, the story of Putraka in Somadeva's *Kathāsaritsāgara*; the skt. story of a śāṅkha which gave dinārs every day; *Daśakumārcarita* ch. ii; the magic couch in the story of the Farmer and Moneylender in *Tales of the Punjab*; Fortune and Misfortune in *Orient Pearls* (Shovona Devi); also pp. 76, 77; Day's *Folk Tales of Bengal*, story of the Indigent Brahman, of the Bald Wife; *Folk-tales of Kashmir*, 'Saiyid and Said' (Bhadrapith, thāl, box of collyrium and ragged garment); *Old Deccan Days*, p. 174; *Wide-awake stories*, 199, 216; *Madanakamarajanakadai*, pp. 132-134; and for other Eastern and Western Parallels see "Magical Articles" *Motif* in Mr. Penzer's "*Ocean of Story*" Vol. I, pp. 25-29 and Vol. V. p. 3. For the magic iron rod, the guitar, the cap (making invisible the wearer), transporting wooden slippers, see *Folk tales of Hindusthan—Seven Princes*.

## 2. FOLKLORE OF THE SANTAL PARGANAS.

X. *The Girl who found Helpers*, pp. 42-46.

There was one unmarried sister who had seven brothers all married. The brothers went to far off country for trading. Their seven wives tormented the sister. For instance, she had to bring water in a pot full of holes. The frogs pitied her case and sat on the holes, so she was able to bring water. She was sent to fetch leaves, but no rope was given to her. A *buka sobo* snake pitying her served as a coil. A python coiled round a bundle of sticks which she gathered. The wicked wives then took her to the jungle, put her on a tree, bound thorns round it, and left her there to shift for herself. The brothers returned through the jungle, found her on the tree, took her home, and punished their wives.

In another version Hira the sister was asked to pick up a basketful of mustard seed sown by the wives grain by grain.

The pigeons did it for her. They asked her to bring bear's hair and then tiger's milk. The cubs of the bear and the tiger helped her in giving what she wanted.

A.—(Parallel). THE ORIENT PEARLS BY SHOYONA DEVI  
(MacMillan & Co).

*The Wages of Sin.*

Bija was asked by her seven sisters-in-law to fetch water from a well, but no rope was given to her for drawing water. The crows brought the water in their beaks and filled the bucket for her. She was then asked to separate the husk from the grain of a quantity of unhusked paddy without the help of mortar and pestle. The finches did the job for her. She was then sent to the dense jungle to fetch Ākanda plant (*Asclepias gigantea*) for them hoping she would be devoured by wild animals. She was found there by her brothers who were returning. The wicked wives were caught in their own snare, applied the milk of the Ākanda to their eyes (which they pretended they nearly wept out for their husbands) and got blind.

B.—(Other Parallels.)

In the Santali tale we read ; " So one day they gave her a pot full of holes and told her to bring it back full of water." We are reminded of the similar task given to Śree Rādhikā in the episode known as her *Mānabhañjana*.

This is really a *task motif* occurring largely in fiction. Cf. *Psyche* in the *Golden Ass* of Apuleius Lib. cap. X ; Grimm's *Märchen*, Nos. 62, 186, and 193 ; *Svend's Exploits* in Thorpe's *Yule-tide stories* ; No. 83 of *Sicilianische Märchen*, and Stoke's *Indian Fairy Tales* (tale No. 22). Cf. also the story of Tapai in the *Khudrukuni* or *Bhālukuni Osa* of Orissa.

### 3. FOLKLORE OF THE SANTAL PARGANAS.

#### XXVIII. *The Wife who would not be beaten.*

A Raja's son would marry only that woman who suffered herself to be beaten every morning and evening. With much difficulty a princess agreeing to the condition could be found. One day when the Prince started to beat his wife, she asked him to desist till he earned and made a position for himself. So he set out on trading and reached the Lutia country. When the prince failed to answer a question rightly, the Raja of Lutia seized all his merchandise and left him penniless. He now

served with a man and wore a loin cloth like the poorest labourer. He discarded an old loin cloth which was brought by his servant to the princess who put it away. She now went out and answered the question of the Raja rightly. She had a mouse and a shawl with her. The Raja promised that if the cat which he produced should jump towards any body the merchandise would be his. The cat seeing the mouse peeping out of the shawl of the princess jumped towards her. She, therefore, won and released her husband. After a few days her husband came home and went to beat her. She showed him the loin cloth and proved that in fact he was her slave, whereupon he gave up the idea of beating her.

A.—(*Parallel*). FOLK TALES OF KASHMIR.

*All for a Pamsa.*

A merchant's son married an ironsmith's daughter on condition that he would beat his wife with shoe seven times a day. She persuaded her husband not to beat her on the first night and then for the first week and went to her father's house. She said she would gladly suffer herself to be beaten when he earned something for himself. The merchant's son went out trading and came to a garden where a lovely woman played *nard* with him and used the cat trick to extinguish the lamp when she was losing. He lost every thing and was put in prison. The wife now put on a disguise and went to the gambler's country. She learnt the secret of success from the woman's servants and put a mouse in her pocket. The cat went out after the mouse and did not brush the lamp aside. The wicked woman lost the game, surrendered herself to her lovely winner, and restored the merchant's son and his merchandise to her. The foolish husband did not know who rescued him. On his return home he proceeded to beat his wife, when she showed him his ragged clothes he put on as a prisoner and which she carefully put away in a box. He had to admit his defeat and gave up the idea of beating her.

B.—(*Parallel*). THE ORIENT PEARLS.

*The foolish Vow.*

A prince said: "Whoever shall wed me must submit to be beaten five times with a shoe, the first thing every morning." A princess married him on that condition, and made him put off the beating, saying: "A husband unable to support his wife has no right to exercise his power over her." The prince set out trading and was cheated in succession by two swindlers, each wanting a leg, and an eye, till he was robbed outright by a woman who falsely accused him of theft of a silver key and

which he could not rebut. He now became the slave of an oil-monger. His wife now dressed herself up as a Prince, dealt rightly with the swindlers, defeated the wiles of the woman, recovered all her husband's merchandise from her, ransomed her husband and got a written agreement from the oilmonger transferring to herself his ownership of her husband. The Prince in gratitude gave her his ring as a souvenir. When he returned home he proceeded to beat her when she proved that he was her slave and had therefore no right to beat her.

C.—(*Parallel*). FOLK TALES OF ORISSA.

*The story of Maunavati.*

Cf. The story of Maunavati in *Folk Tales of Orissa*. The Prince would not marry unless a girl were found who could bear ten blows at his hands. A princess married him on that condition, and agreed to be beaten provided he could make Maunavati speak. He set out, but being unsuccessful was put in prison. His wife taking the guise of a young man set out, made Maunavati speak, released her husband and ultimately cried shame on her husband when he essayed to beat her.

D.—(*Parallel*). ROMANTIC TALES FROM THE PUNJAB BY  
CHARLES SWYNNERTON (Vol. I of a New Re-issue.  
Oxford University Press, 1928).

*The Prince and his Vizier* (pp. 265 ff.).

A man told his father that he could marry a woman who would allow him every morning to strike her five times with a shoe. A girl consenting to that condition was found and married to him. When he wanted a satisfaction of the stipulation the wife put him off from day to day till one day she broke out: "What right have you to beat me at all, since you do not contribute a farthing to my maintenance?" and she adjured him to earn the right to beat her by earning wages. So he sailed on and by and by came to a garden. He ate a mango and threw the stone away from which instantly sprang a tree laden with mangoes which ripened before his eyes. He took a mango with him wishing to work wonders with it and thereby grow rich. He made a wager that if he could grow instantly a tree with ripe fruits on it people would have to give him four thousand rupees, if he failed he would lose the stake. He lost the wager and was deprived of his money and merchandise. Then he supported himself by cutting grass and selling it. His wife dressed herself as a man, turned a merchant, came to the garden, ate the ripe fruit, made the selfsame bet with the same people, and gained it, for she took some of the garden earth in which she planted the stone of the mango. She

met her husband who did not recognise her and offered him service, taking care to take from him his old clothes, his net and his sickle. She returned to her home. On coming back when the man wanted to have his five blows, the wife produced the mementos of his degradation as a grass cutter, and the man was covered with confusion, returned to his father's house and remained in the dumps for days.

*E.—(Other Parallels).*

*Wide-awake stories*, pp. 277–279 ; 427.

The use of the cat and the rat or mouse as a trick for dishonestly gaining a wager is a familiar motif in fiction. In our younger days we heard many such stories.

In the *Rasālu* Legend in Swynnerton's *Romantic Tales of the Panjab* we read (pp. 157–158) "...Raja Sirikup will then play *chauput* with you, and his wife and daughters will sit before you to divert your eyes, and in the meantime you will lose the game, and Sirikup will win it, after which he will cut off your head. But if he cannot prevail over you in that way, he will call forth his rats, Hurbuns and Hurbunsi, who are kept for that very purpose, and who will come and take away the wick out of the lamp, and there will be confusion, and Sirikup will make you the loser..." *Rasālu* bought a cat from a weaver and played the game with Sirikup. The cat swallowed up the male rat Hurbans; the female rat did not come and *Rasālu* won the game.

#### 4. FOLKLORE OF THE SANTAL PARGANAS.

##### XXVII.—*The Flycatchers' Egg.*

A herd boy got a flycatchers' egg which his mother kept in a shelf and forgot all about it. From the egg came out a *bonga* girl and ate up the food of the boy daily, but she would cook rice and *dāl*, eat up a portion, comb her hair and go back to the egg. The boy one day watched and surprised the girl. He took her to wife, and lived happily of course.

##### LXXV.—*The Caterpillar Boy.*

##### LXXXV.—*The Dog-bride.*

*A.—(Other Parallels).*

Examples of the "Husk myth." See introduction to Schiefner and Ralston's *Tibetan Tales*, pp. XXXVIII ff.

Cf. De's *Folk Tales of Bengal*, first part of the story *Swet Basanta* (pp. 93–96).



A merchant's son got a *toontooni's* (a small bird) egg, and put it in the almirah. The egg burst and out came a beautiful girl. She grew and daily helped her to a portion of the food served for the merchant's son. He hid himself; secretly watched, surprised the "beautiful damsel of sweet sixteen" as she stepped out and of course married her.

Cf. the story of *The Prince and Pān Shāhzādi* (No. 60) in the *Folk tales from Northern India* in *Indian Antiq.*, Vol. LIV, p. 33. The prince brought a *pān* leaf which he saw floating on the river, and placed it on a shelf in his room. Every night a princess came out of the leaf, and ate his food. He secretly watched, seized her and made her live with him as his wife.

Cf. the story of *A flower nymph* (No. 28, Ho Folklore, JBORS, Vol. IV, pp. 338-339). Cf. *Shaharzadi Monkey Peri* in the *Seven Princes* in Shaikh Chili's *Folk Tales of Hindustan*.

## 5. FOLKLORE OF THE SANTAL PARGANAS.

### XIV.—*The Prince who acquired Wisdom.*

The prince travelled to get wisdom. He got for three gold pieces three maxims and one extra free of charge from a ploughman. They were (1) "whenever you go to visit a friend or one of your subjects and they offer you a bedstead, or stool or mat to sit on, do not sit down at once but move the stool, or mat a little to one side;" (2) "whenever you go to bathe, do not bathe at the common bathing place, but at a place by yourself;" (3) "when men come to you for advice or to have a dispute decided, listen to what the majority of those present say, and do not follow your own fancy;" and (4) "Restrain your anger, if anything you see or hear makes you angry, still do not at once take action; hear the explanation and weigh it well, then if you find cause you can give rein to your anger and if not, let the offender off." All these maxims proved well to the Prince.

#### A.—(Other Parallels).

All these maxims will be recognised to be familiar to the Bengalis who have any recollection of nursery tales heard in youth.

Cf. the story of "*Jangal Nagari*" in *Shaikh Chili's Folk Tales of Hindustan*.

Cf. the story of "*Wisdom Seller*" in *Folk Tales of Sind and Guzarat* (1925) by C. A. Kincaid.



## 6. FOLKLORE OF THE SANTAL PARGANAS.

XVI.—*The Miser's Servant*, pp. 60-63.XXX.—*The Raja's son and the Merchant's son*, pp. 123-127.LXXXVI.—*Wealth or Wisdom*, pp. 256-262.

A miser made his servants work for nothing, and gave them very little to eat. Kora wanted to teach him a lesson, and agreed to work on these conditions—one leaf full of rice three times a day; one grain of rice once a year and lowland to plant all the seed from it; similarly one seed of maize and upland to sow all the seed from it. If he leaves, his little finger may be cut off, if his master does not give him the wages, his little finger will be cut off. He brought a plaintain leaf to receive his food; and gradually used up all the lowland and the upland in a few years.

The Raja's son and the Merchant's son served on wages amounting to as much rice each day as would go on a leaf; if they threw up work they would forfeit a hand and an ear, which would also be the penalty with their masters if they discharged them so long as they wanted to work. The foolish Raja's son died. The merchant's son who called himself Ujar ate from a lotus leaf and not tamarind leaf, and was asked to hoe the sugar-cane which he dug up all. The master was angry but Ujar said he obeyed his master's order faithfully; his master did not ask him to hoe the ground. Similarly, pretending not to understand he chopped up to bits the hemp he was asked to scrape. When his master asked him to give his son a good washing in the tank, he, following the washerman's fashion, knocked out the poor child's brains. When his master to get rid of him gave him a letter to carry to his father-in-law asking him to kill the bearer directly, he made some changes in the letter with the result that he was married to the youngest daughter of his. Ultimately he killed his master.

The merchant's son stopped the hole in the leaking trough with clay and filled it to the brim, took out the vicious bullock to graze and tethered it to the tree, then killed it with the axe and threw the carcase in the ravine; pretended that the sickle had fever (as it lay in the sun) and therefore could not reap the rice; asked to start a fire in the big house and boil some water, he set the house on fire. The poor master could not dismiss him, according to the contract, so long as the servant kept to its terms; if he did so, he would have to lose his little finger. He therefore gave him a letter to carry to his father-in-law who was asked to kill the bearer directly. Ujar made an alteration in the letter and got his daughter to wife. The master for fear of losing his finger left his house for good.

## A.—(Parallel). THE ORIENT PEARLS.

*A Nose for Nose* (pp. 101 ff.).

A miserly couple used to engage one servant between them on this condition: "If thou leavest our service on any account, thou shalt give thy nose to us; on the other hand if we ever dismiss thee, thou shalt have our noses." The younger brother of a boy who lost his nose came and accepted service and worked hard till he devised a plan to be revenged on the couple. He would steal into the pantry and help himself to all the bread, butter and cakes. Asked to bring some mutton for them, he slaughtered all their sheep, and when rebuked, replied with mock humility that he had obeyed the order and brought the mutton; he was not asked to go to the market for it. When asked to quiet their boy who was crying, he strangled him to death and made him as quiet as the grave. They now wanted to flee from the boy and in a wooden trunk was put some refreshment. The boy in advance got into the trunk and enjoyed a free ride on the head of the master. When the latter in the middle of the way opened the lid to get some refreshment, out sprang the boy like a ghost and surprised them. They planned to drown him in the well, but he so managed affairs that the man pushed his wife into the well. He ran to his master's father-in-law and said that he had suddenly gone raving mad. As the poor master came to his father-in-law's place two stalwart men held him down and applied lashes to him (thanks to the mischievous urchin of a servant). Maddened by the pain he cried out "Come and take my nose, and begone thou rascal!" This he did, and exacted "a nose for a nose."

## B.—(Other Parallels).

*Cf. The story of the Cruel Merchant in the Folk Tales of Kashmir.* *Cf. the unpublished Bengali story of Ghughu and Phānd, the stupid and the clever brother, whence the proverb* —বুঝে দেখেছো ফাঁদ দেখনি (*Gughu dekhecho, Phānd dekhoni*; you have seen Ghughu but not Phand). *Cf. the Ho tale No. 19, in the Folklore of the Kolhans—the Prince who became the king of the jackals.*

*Cf. the story of "Sheikh Chihli (Chehlu)" in Hindi to be had in all the bazars, e.g., in Patna, which closely follows the story of "A Nose for Nose."*

## 7. FOLKLORE OF THE SANTAL PARGANAS.

XXXVIII.—*Chote and Mote.*

They were two brothers, poor but industrious. Chote served an oilman whose bullock fattened on oilcake, kept run-

ning after herds of cattle, and tired him out. Mote served a potter who overworked him and abused him in the bargain. Both wanted to exchange places and as an inducement began to extol their respective position. Actual work disillusioned both. Chote luckily found some money at the foot of a custard apple in the potter's house and both decamped with the money.

A.—(Other Parallels).

Story No. XI. *The Adventures of two Thieves in the Folk Tales of Bengal.*

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#### 8. FOLKLORE OF THE SANTAL PARGANAS.

##### XXXIX.—*The Daydreamer.*

A Santal was carrying for wages of two annas a flat basket containing oilpots. He mused in this train—with one anna he would get chickens, and with profits from the sale he would purchase goats, then some cows, then buffaloes, then he would marry and have children. The latter would say "Father, wash hands for your dinner." He shook his head, saying, "No, no, not yet" and the oil pots fell and were smashed. When the oilman complained of his loss the Santal explained he lost much more, viz., his goats, buffaloes, wife and children, whereas the oilman lost oil only.

A.—(Other Parallels).

Cf. the *Pañcatantra*. The story of the Brahman who built air-castles (Edgerton *Pañcatantra Reconstructed*, pp. 398 ff.). Alnaschar building castles in the air.

Cf. the Hindi book of story of Shaikh Chuhli (Chilli).—A very close parallel. Cf. La Fontaine's *Contes* the story of the milkmaid, showing migration of the *Pañcatantra* tale to the west.

Cf. *Dhpḍ. Commy. Cittavaga* III. 4. *Nephew Saṅgharakṣita*, also *Tantrākhyāyikā* VI.

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#### 9. FOLKLORE OF THE SANTAL PARGANAS.

##### XL.—*The Extortionate Sentry.*

A.—(Parallel).

Cf. the familiar story of a fisherman bargaining with a sentry who demanded half the price of the fish as tip for

giving him entrance. He fixed a hundred stripes for the fish, so that the dishonest sentry might get fifty stripes for his desert.

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## 10. FOLKLORE OF THE SANTAL PARGANAS.

### XLII.—*A story told by a Hindu.*

Two sons of a Raja divided the kingdom between them. The elder brother gambled away to his younger brother everything, and ultimately his share of the kingdom. In shame the elder prince quitted his country accompanied by his wife, wandered about in the jungle without food, and was thoroughly spent. He asked his wife to return, but she would not hear of it. He could not bear to see his wife suffer thus and at night he deserted her. Some divine being taking compassion on her, appeared to her in human guise and led her safely out of the wood. She begged her way to a Raja's palace where she was engaged as a servant. By and by her husband, not getting more than a day or two's work as a labourer elsewhere, came to the Raja's palace and served as a groom in the palace stable. At length the wife recognised her husband and told her story to the Raja who asked all the syces to cook rice, and bring it to him. The wife, tasting the cooked rice, told which was her husband's cooking. The prince had to admit, was united with his wife and was ultimately given back his share of the kingdom.

#### *A.—(Parallel).*

The story of Nala and Damayantī is exactly its original.

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## 11. FOLKLORE OF THE SANTAL PARGANAS.

### XLIII. *The Raibar and the Leopard.*

A matchmaker finding a leopard in the jungle was frightened out of his wits which however he collected and he promised to find a bride for him by an artifice viz. the leopard was to get into a sack. After heavily cudgelling him, to death as he supposed, he threw the sack with the leopard inside into a river. It floated down the stream and was hauled up by a love lorn leopardess. They married and both thanked the matchmaker for his troubles and richly rewarded him.

## A.—(Parallel).

The Bengali story (unpublished I think) of the matchmaker getting a bride for the tiger must be its original. The familiar phrase *adhivāse tikle haya* (অধিবাসে টিকলে হয়) has been derived from this story.

## 12. FOLKLORE OF THE SANTAL PARGANAS.

XLIV. *The Ungrateful Snake.*

(a) A Raja's son was married in infancy, but did not know of it. One day riding past a tank he was informed by an old woman that he was married while an infant. He was determined to go off at once to his father-in-law's and see his wife. On the way he saw a field of thatching grass on fire, and in the middle, surrounded by the flames, was a huge poisonous snake, unable to escape. The latter offered a boon to the prince if he rescued him. Being assured that the snake would not devour him when saved, the prince rescued him. Once safe the ungrateful snake proposed to eat the prince up.

(b) Despairing of his life the prince begged the snake to allow two or three judges to decide whether it was fair that he should be eaten up by the snake to whom he gave life. The first judge was a banyan tree which decided against the prince, saying that it was only fair that the benefactor prince should be killed: "this is the justice we have learnt from human beings; you enjoy the shade of us trees and in return you lop off our branches, and do us all manner of injury, it is right that the snake should eat you." The second and third judges were a cow and water which complained of illtreatment by men to them,—e.g. driving away the calves, taking milk and giving hard work in one case, and dirtying the water in the other.

(c) The snake let the prince go his way and see his bride on his promising to return to him to be devoured.

(d) The prince was received with honour at his father-in-law's but was disconsolate. Urged by his wife he told the whole story to her. The prince returned accompanied by his wife to the snake. Though asked to go back to her father's house, the wife clung to him and offered herself to be eaten by the snake so that her husband might be spared; for if he was eaten she would have no one to support her. The snake promised to teach her an incantation by which she could support herself, and instructed her, "if she took some dust in her hand and repeated the incantation and then blew on the dust, any person on whom she sprinkled it would be burnt to ashes." She also learnt from him how to restore the people to life. She now cleverly used the trick and threw the enchanted dust over the snake which was burnt to ashes.

A.—(Parallel). ROMANTIC TALES FROM THE PUNJAB  
BY SWYNNERTON.

*The young Bridegroom and the Serpent.*

(a) The son of a farmer proceeding to his father-in-law's saw in a lonely jungle a snake of enormous dimensions in deadly combat with a mongoose from whom he saved him. The snake offered to eat the lad, for the custom of those parts was to return evil for good.

(c) The snake let the boy go on the latter's promising to return to him in eight days.

(d) The boy remained downcast at his father-in-law's. On the eighth day he started for his home, his wife accompanying him. He asked her and the servants to go back, for, said he, he was fated to die. The wife clung to him, the servants returned. They now came to the snake who started to devour the boy. The wife pleaded and asked for the origin of the strange custom of returning evil for good.

(b) She was referred to the *tāli* trees which said that they saved the life of a thief who, an ungrateful wretch as he was, caused one of them to be hewed down.

(d) The girl offered to be eaten first and wept copiously. The serpent gave her for comfort two pills which when swallowed by her would give her two sons who could support her. But she pleaded that to have sons in the absence of her husband would affect her good name. The snake now brought out two more pills and gave them to her saying: "Revenge will sweeten your lot. When any of your neighbours revile you on account of your sons, take one of these pills between finger and thumb, hold it over them, rubbing it gently so that some of the powder may fall on them, and immediately you will see them consume away to ashes."

By that very trick she killed the snake and saved her husband.

B.—(Original). THE KATHĀ SARITSĀGARA.

(Nirṇaya Sāgara Press—pp. 584-585.)

*The story of Kesatā and Rūpavatī.*

This is really the origin of the Santālī and the Panjābi tales which have been modified. The Panjābi variant may have been current in Bengal, as further research may show, and was then appropriated by the Santals.

The *Kathāsarit* story is this: Kesatā, beautiful as the second God of love, was the son of a rich Brahmana of Pātali-putra. Roving along he came to the bank of the Narmada where he found a marriage procession. An old Brahmana



requested him to be the proxy of his son as a bridegroom, for the latter was the pattern of ugliness going to be married to a very beautiful bride, and deliver the bride to him after the marriage was over. Kesata agreed. In the evening darkness when Kesata was going to the water's edge he found a terrible Rakshasa who offered to devour him. Kesata asked him to desist for the while, promising to return to him after he had done the business for the Brahmana. The Rakshasa released him. He was then married to Rūpavati, and every one was delighted with the well matched couple. But Kesata remained morose and was engrossed in deep thought. Finding him thus Rūpavati feigned sleep. Imagining that she was asleep, Kesata stole away from the bridal chamber, but was followed unnoticed by Rūpavati. The Rakshasa approved of his courage and was proceeding to devour him when suddenly Rūpavati intervened, saying: "Eat me rather; what would happen to me if my lord were devoured?" (*Mām khāda bhaksite hyas-minpatyau kām me gātī bhavet*). The Rakshasa said: "Beg alms." She asked, "Who would give me, a woman, alms?" Then the Rakshasa said: "If you beg alms of anybody, and he refuses, his head would split into hundred pieces." She said "*Tarhi tvameva me dehi bhartṛbhikṣānimāiti*—Then you give me my husband by way of alms (lit. the alms of my husband to me)." As he refused to do so, his head split. Thus she saved her husband.

C.—(*Other Parallels*).

The "Promise to return" [12 (c), and 12 A (c)] is a familiar motif in fiction. See N. M. Penzer's *Ocean of Story*, Vol. III, 33; VII, 203–204; and IX, 55.

Cf. *The Parable of the Hunter who was moved to compassion* (pp. 28, 29) in the *Life and Stories of Pārśvanātha* (edited by Dr. Maurice Bloomfield—Baltimore, 1919). —"A certain hunter in a forest, his bow at the point of his ear, was implored by a gazel facing death to be spared, until she had nursed her young, otherwise sure to perish from hunger. She would take upon herself the consequence of the great five sins, *if she did not return after having nursed them*," also pp. 183, 184 of the same book.

For the "Head bursting" motif see Brhaddevatā, 4, 120; Pārśvanātha, 2, 812; Jātakas, 210, 358, 422; and "*Devil Tricked*" ('Dummer Täufel'), see kathās, 28, 156 ff.; ZDMG. lxi, 20 with note on p. 69.

I am quoting the following from p. 184.

Vetālapañcaviṃśati: Śivadāsa, 9; Kathāsaritsāgara 84; Baitāl Pachisi 9, Madanasenā is engaged to Samudradatta. Dharmadatta sees her, falls in love with her, and exacts from her a promise that she will come to him, untouched, on her

bridal night. Her husband generously permits her to go to her ardent lover. On the way she is seized by a thief, who is also ravished by her beauty. She tells him of her tryst with Dharmadatta, and begs him to wait for her return, because she must keep her promise. When she comes to Dharmadatta, she tells him what has happened. Rejoiced at her truthfulness, he lets her return to the thief, who in turn is moved by her faith, and allows her to return to her husband with whom she lives happily ever after. For parallels outside India see Tawney in his *Translation of Kathā saritsāgara*, vol. ii, p. 281; Oesterley, *Baital Pachisi*, p. 197 ff., also *Hitopodeśa* in *Braj Bhākha* (Hertel, *Das Pañcatantra*, p. 56, who cites a variant from Hemaviṣāya's *Kathāratnākara*), the cow's promise to return to the lion; also *Jātaka* 513, the king's promise to return to the ogre.

For 12 (b), 12 A (b) cf. the familiar story of the Tiger, the Brahman and the Jackal who tricked the tiger back into the cage and saved the Brahmana. See also Steel's *Tales of the Panjab* (pp. 107 ff.), also stories Nos. 14, 22, 23, *Ho Folklore—A Fox's Ruse*, etc. in *JBORS*, Vol. II, p. 289; Vol. IV, pp. 324–327. Cf. the story of the *Man and the Snake* in the *Myths and Legends of Ancient Israel*, Vol. III, pp. 82–83, by Angelo S. Rappoport (Gresham Publishing, 1928) for the modification of the Indian story to illustrate Solomon's wisdom.

### 13. FOLKLORE OF THE SANTAL PARGANAS.

#### CVII. *The Leopard outwitted.*

A hunt was made to kill a man-eating leopard who overtook a merchant and requested him to save it, swearing an oath not to eat him. The merchant hid it away in a sack, put it on his bullock and drove on. Directly the sack was untied the ungrateful animal proceeded to devour the merchant, who unsuccessfully referred the matter for a fair arbitration to a stream, and a tree which decided against him. Then he appealed to a jackal who wanted to see how it was done, pretending not to understand the matter, and tricked the leopard to get back into the sack. The leopard was then killed.

A.—(*Other Parallels*)—See No. 12.

### 14. FOLKLORE OF THE SANTAL PARGANAS.

#### LIII. *Tipi and Tepa.*

They lived on baked cakes. A bear in the jungle wanted to eat them up, but spared them on condition that they would give



him cakes to eat. They baked the cakes for the bear, but ate them all and hid inside a gourd which was carried off by the bear on the shoulder. Whatever fruits the bear gathered and put inside the gourd were eaten up by the occupants till Tapa burst, and the noise frightened the bear away.

A.—(*Others Parallels*).

Unpublished Bengali story of the same name, but it is a tiger and not a bear. They hid in an earthen jar. Cf. also G. Misra's *Indian Folk tales*—the story of the *Feast of Cakes* (No. IX). In May last (1929) I heard the same story in Oriya at Cuttack which exactly corresponds to the Bengali tale.

## 15. FOLKLORE OF THE SANTAL PARGANAS.

### XLV. *The Tiger's Bride.*

A woman had cut thatching grass in the jungle and made a pile too heavy to lift on to her head. She promised to give her daughter to anyone who would help her. A tiger helped her; she had therefore to give her daughter in marriage to him. The latter asked his wife to cook him a feast to which he went out to invite his friends. The girl caught a cat, killed it, hung it over the fire, so that its blood dropped slowly into the pan and made a fizzling noise as if cooking were going on. Meanwhile she fled to her mother's house, climbed a tree and sang a song. The disappointed friends of the tiger, cheated out of a feast, beat him, so that he ran away and was no more seen.

A.—(*Other Parallels*).

An unpublished Bengali story runs thus. Some girls had gone to the jungle and climbed the cowrie tree belonging to a tiger and rifled it while the tiger was away. On the latter's approach all fled excepting a girl who hid herself away in the branches. The tiger lay down. The girl despairing of escape began to weep and hot tears falling on the tiger discovered her. On her promising to marry him (he was a widower with two cubs) she was not eaten, but asked to prepare a feast. While the tiger went out to invite his friends the girl killed the cubs and let their blood fall on the frying pan which simulated cooking. The girl fled away and ultimately killed her husband (when he came to her house to demand her back) by throwing hot gruel over him.

16. FOLKLORE OF THE SANTAL PARGANAS.

LIII. *The Child with the ears of an ox.*

A Raja was anxious to hide the bovine ears of his child. The barber found it out when shaving the child's head, but being warned vowed not to babble it out. But his stomach swelled to an enormous size which diminished only when he divulged it to a Dom, who made a drum by cutting down a tree. He sang as he drummed :

“The son of the Raja  
Has the ears of an Ox.”

A.—(*Other Parallels*).

Cf. King Midas and his Ass's ears and the Barber. Substantially the story is current amongst the Biharis, at least in Monghyr, and I have heard the story told in Hindi.

17. FOLKLORE OF THE SANTAL PARGANAS.

XVII. *Kuwar and the Raja's Daughter.*

A Raja founded a school where his sons and daughters used to read. Kuwar the son of a rich merchant attended that school. He and the Raja's daughter fell in love with each other. She wrote him a letter to marry her; ultimately they planned to run away. But their intentions were discovered and they were watched. The princess went to Piyari, a mare in the royal stable, and she promised to do her bidding. A day was fixed for elopement. The mare jumped over the wall and carried the princess to a tree where Kuwar was waiting, and driving like the wind she transported them to a far country. Unwittingly, they took shelter in the house of an old woman whose seven sons were robbers and murderers. The old woman wanted to get the princess to her youngest son's wife and to kill Kuwar. So she gave her rice and cooking pots to delay them. After finishing their meals the pair mounted Piyari and galloped off. The old woman to hasten the return of her sons set fire to her hut on which signal they hurried home. The seven robbers caught them up, killed Kuwar and asked the youngest brother to snatch the princess off the dead body of Kuwar over whom she was weeping. At his intercession the princess was left there with her dead lover. Meanwhile Chando pitied her case, but sent Bidhi and Bidha to test her constancy. They assumed the forms of tigers and leopards but could not frighten her into yielding up to them the corpse of her lover. Pleased with her Chando restored Kuwar to life.

XXVI. *The Merchant's Son and the Raja's Daughter*  
(Variant of the above story).

A.—(Other Parallels).

Cf. the story of "Sakhi-Sonā" in its several versions in the "Folk literature" of Bengal (D. Sen's) pp. 200-232, including that of "Pushpamālā" in *Dakshināranjan Mitra Majumdar's* book.

The Uzir's son Manik and princess Sakhi-Sonā read in the same Makhtub. They fell in love and eloped; and ultimately came to the house of the mother of the seven dacoits. She gave them wet fuel and rice to cook. They were however warned of their danger, and fled. But the old hag tied a leaking bundle of mustard seeds to the tail of the horses. The seven brothers overtook them by this sign. Manik killed six brothers but was killed by the seventh; and was again restored to life by a *pir* (saint). They then came to a flower woman who falling in love with Manik changed him into a monkey. Now disguised as a youth Sakhi-Sonā came to a city where she was put in prison, but having killed a serpent who devastated the city was married to the princess. Manik was restored by Sakhi-Sonā to his own form and lived happily with his two wives.

Fakir Rām's version is almost the same. The hero (Kumāra) is changed into a goat. In Mitra Majumdar's version the hero is revived through the grace of Siva.

Cf. in the *F.T. of Orissa* the story of *Halahal Kumara or the Snake Prince* (p. 100 ff.); here they are seven monsters and their mother, with the incident of mustard seed bag tied to the tail of the horses, where the hero Abhimanyu kills the six brothers but spares the seventh and was ultimately killed by him. Sasisena (version of Sakhi-Sonā), the heroine, makes Tima the monster disgorge her husband and ultimately revives her husband through the grace of Siva. The Sorceress Maluni, Jnandei metamorphoses Abhimanyu into a ram. Sasisena kills a fierce *Gayal* and wins the hand of the princess. She causes Abhimanyu to be restored to his human form.

For a close resemblance to the *Orissa* version see Kincaid's *Tales of old Sindh* (1922, OUP) story of *Kamsen and Kamrup*.

## 18. FOLKLORE OF THE SANTAL PARGANAS.

XLVII.—*The Dream.*

The wife told her husband in bed that she had dreamt she had dug up a pot full of rupees; she wanted to test the dream next morning. Some thieves who were on the roof desiring to forestall her went to the place indicated in the

dream and dug out the pot. When the lid was taken off a serpent popped out its hood and hissed at them. They put the lid back, carried the pot to the roof, and through the opening in the roof dropped it intending to punish the wife. As it fell the snake changed into a stream of money.

A.—(*Other Parallels*).

Cf. a Bengali story exactly like this, also Dr. D. Sen's *Folk Literature of Bengal*, p. 196 where Syed carried home a cobra, to kill his sharp tongued wife, in a pot. At midnight it was changed into gold coins.

Cf. also No. 325, p. 224. T. II of *Cinq Cent Contes et Apologues* "celui qui avait trouvé un mangouste d'or." (...et le serpent se changea de nouveau en or) cf. Julien, *les Avadānas* t. II, p. 92-93.

## 19. FOLKLORE OF THE SANTAL PARGANAS.

### LV.—*Jogeshwar's marriage.*

A jackal being trapped by a weaver was released on promising to marry him to a Raja's daughter. He prevailed upon the Raja to choose Jogeshwar, the weaver, as his son-in-law (though he had not seen him) and fix a wedding day. He got all the paddy birds to mount the jackals. A procession of white horsemen stretching over two miles was thus artificially managed. Jogeshwar was taught how to behave and the wedding passed off smoothly. The disillusionment came only when the bridal party reached Jogeshwar's hut.

A.—(*Other Parallels*).

This is a very familiar nursery story, we knew it all in our younger days.

Cf. the story of the *Clever Jackal* in *F. T. of Kashmir*, pp. 186-188. (Footnotes on p. 188. Cf. Chilian story. "Don Juan Bolondron in Folklore Journal" Vol. III, p. 299; also Mongolian Tale in the same Journal, Vol. IV, p. 32); *F. T. of Bengal*—The Match-making Jackal, pp. 226-235. A very close parallel will be found in the *Ingenious Orphan* see J. H. Hutton's *The Angami Nagas* (1921).

## 20. FOLKLORE OF THE SANTAL PARGANAS.

### LIX.—*The Charitable Raja.*

A Jogi came to a charitable Raja and demanded his kingdom and everything of him. The Raja granted his request and

went out a beggar with his wife and two children. Reduced to misery the Rani went to a merchant to beg for some clothes. He fell in love with her and shut her up. The Rajah went in search of her and came to a flooded river. He carried one child across first, but was swept away by the current when he was returning for the other. A childless *goala* woman brought the children up. When the Raja was stranded far down the river, he found himself surrounded by a crowd. An elephant belonging to the Raja of the country who died without an heir chose him to be the king, carried him on his back and seated him on the throne. Meanwhile, the two boys grew up and became Sipahis at the royal palace. On a festival the merchant came with the queen, and it so chanced that her own sons kept guard over her. As they talked they were recognised to be her own sons. And the whole family was happily united.

LX—A variant. In this the Raja was swallowed by a fish and was again found to be whole when the fish was cut open. He was engaged as a retainer by the Raja of the country when he came. His abandoned boys were also found out. The queen was seized by a wicked merchant. She was discovered by the Raja and his sons. And they met; but the tale does not end happily.

A.—(*Other Parallels*).

We are reminded of Raja Harishchandra's great gift.

Cf. the story of the *Hawk and the King-maker* in *Orient Pearls*, pp. 13-19. The king at the request of a rascal disguised as a holy man, left the state to him and set out with the queen and his two little sons. A merchant took away the queen by false pretences. The king did not find her. A stream stopped his progress. He left one Prince on the bank, and with the other on his shoulder began to cross the stream. A tiger came and carried him away; as the king turned to look, the prince on his shoulder was jerked off into the water and drowned. He wandered by and by and came to a territory whose king had just died. There was a quaint old custom of choosing a successor by lot. The people came with a hawk and a gold crown. The hawk perched on the head of the king and chose him as the new king. The merchant brought the queen as a bride to the new king; and a hunter and a fisherman brought the two princes, who as they talked among themselves were recognised by the queen.

Cf. the story of *Kuhuka mandala* in the *Folk Tales of Orissa* pp. 156. The young merchant left his wife, a child and a new born babe to bring some fire-wood. Meanwhile the *pāt-hūti* (the elephant royal) chose him to be the king and carried him away. The princess was forcibly carried away in a ship apparently by some pirates to make her the new king's consort.

The children were found by some milkman and reared up. When grown up they accompanied their father to the palace and were detained by the queen who took a fancy to them. The elder boy related his adventures to his younger brother and was overheard by the queen and all were happily united.

Cf. *Pride Abased in Folk Tales of Kashmir* (p. 165 ff.).

Cf. G. Misra's *Indian Folk Tales*—The wonderful bird.

B.—(Original). *Life and stories of Pārśvanātha*, p. 63–68.

*Story of the Chaste royal pair Sundara and Madanaballabhā.*

I believe the stories in the vernaculars have all been derived from the Jaina story which is this. Good King Sundara of Dhārāpura and his queen Madanaballabhā had a pair of exemplary sons, Kīrtipāla and Mahāpāla. Being warned one night by the house divinity that his would be a rude fate, the king realising that his trials must be due to his karma, chose to shoulder them without delay. He placed his kingdom in charge of his minister Subuddhi and went out with his wife and children in humble garb. While asleep on the road he was robbed by a thief who took away the provisions and also the signet ring. Plagued by hunger and thirst all four arrived at the City of Prthvīpura. A merchant Śrīsāgara allowed them to live in his camp. The queen earned their living by doing chores in neighbouring houses. Somadeva, the head of another caravan, enamoured of her, carried her off to his own city, but her virtue foiled his designs. Meanwhile Śrīsāra, another merchant, pitied the king's conditions, and offered him shelter and food for the service of the boys who tended his temple. But as the latter hunted birds he beat them. The king started with the boys, crossed a dangerous forest and arrived at an unfordable river. He put one of his boys on his shoulder, crossed the river, and left him there. But on returning to fetch the second, he was carried off his feet by the flood, and saved him by floating on a log. Thus separated, in despair, by and by he came to Śrīpura, in the outskirts of which he went to sleep under a mango tree. The king of Śrīpura having just died sonless, the five oracle method (*pañca divya-adhi-vāsana*) of finding a successor was employed. The procession of elephant, horse, chowries, umbrella, and water jug, headed by the court arrived at the spot where Sundara slept. The horse then neighed, the elephant roared, the waterjug emptied itself on the king, the umbrella stood over his head, and the two chowries waved.

The king's two sons separately wandered far, but in time each arrived at Śrīpura and met at the watch of the town. The merchant Somadeva also, having Madanaballabhā, their mother, in his caravan, came to that city, and asked the king

for watchmen for his caravan. The two boys were assigned to this duty. By night, in order to pass time, the two brothers told their own stories, and were overheard by their sad mother who lay awake. She came out and embraced her long-lost children. All were united and lived happily.

For the *pañca divyādhivāsa* see my article on the *Originals and Parallels of Folklore of the Santal Parganas* in J.B.O.R.S., Vol. XII, pt. IV, p. 583 and additional notes in the *Life of Pārsvanātha*, pp. 199. (Edgerton's Article in J.A.O.S., XXX, 158 ff; by J. J. Meyer, Hindu Tales, pp. 131, 212; and by Hertel, Das Pañcatantra, p. 374, etc.) For Harischandra's abandonment of kingdom with a counterpart which the Santal tale begins, see *Life of Pārsvanātha*, p. 91, and foot note No. 33 (Markaṇḍeya Purāṇas 7, etc. "Echoes of the same story may be found in Chavannes, *Cinq cent contes et Apologues chinois*, Nos. 6 and 13, and in Stokes, *Indian Fairy Tales*, pp. 224 ff.") I am somehow reminded of the distress that overtook Prince Vessantara in the Jātakas.

## 21. FOLKLORE OF THE SANTAL PARGANAS.

### LXI. *The Two Wives.*

The Raja's son and the Dewan's son who had married in their infancy wished to see their wives. First they came to the house of the Prince's father-in-law. The Prince slept but his friend kept awake. He saw the Prince's wife leaving her sleeping husband and followed her. She came to her paramour, a Gosain, who reproached her for the delay, and ordered her, if she really loved him better than her husband, to cut off the latter's head and bring it to him. She did so, but was spurned by the Gosain who would have nothing to do with a heartless woman who could kill her husband. She returned and raised a cry that her husband was murdered. But the real facts were proved and she was hanged. The Dewan's son took away the head and body of his deceased friend, put them in a hollow tree and entered his father-in-law's house. At night he saw his wife going out. He followed her to a shrine of Mahādeva who pleased with her devotion offered her a boon. She and her husband prayed that the Prince might be restored to his life which was granted.

#### A.—(*Other Parallels*).

Cf. the *Tale of a Merchant* in *Hatim's Tales* by Stein and Grierson.

The merchant's unfaithful wife has for her paramour a Faquir to whom she brings a dish of cooked rice and begs him to eat. He cudgels her and asks "Why so late?" "My husband has come to-day, hence the delay." "First bring me that



merchant's head and then I shall sup." She cuts off her husband's head and brings it to the Faquir who spurns her. The woman comes to the king's court and complains that her husband was killed by thieves. The king saw everything *incognito* and knew the whole thing.

For the revival of the prince by the grace of Mahadeva cf. the story of Phakirchand in *F. T. of Bengal* pp. 50, 51 where the minister's son through the help of his wife who was a devout worshipper of the Goddess Kālī brings back the Prince's son to life. Cf. the *Upakathā*—a long poem composed by Maharāja Harendra Narayan Bhup Bāhadur of Cooch Behar, a short account of which was published by me in the *Mānāsī-o-Marmavānī* in B.S. 1324. The Cooch Behar Sāhityasabhā is editing the work.

## 22. FOLKLORE OF THE SANTAL PARGANAS.

### LXIV. *The Dumb Shepherd.*

A Raja wanted to test if any of his officers could guess what he was thinking. The Dewan was to find such a man, and when he was perplexed his daughter desired him to present their dumb shepherd before the Raja. When they met the Raja held up one finger, the shepherd held up two. The Raja held up three fingers, at which the shepherd made signs of dissent and fled away. The Raja was mightily pleased. He was arrogant and thought himself to be the most powerful Raja. The Raja explained that when he held up one finger, he meant he was the only one powerful Raja in the world, and there was no second, but the shepherd in holding up two fingers reminded him that there was God "who was as powerful as I am." When he asked him if there was a third the shepherd said, 'No' and went away. This is how the shepherd looked at the matter :—He had three sheep. When the Raja by raising one finger demanded a sheep of him, he offered to give him two, when, however, he wanted all the three by raising three fingers, he dissented and came away.

### A.—(Other Parallels).

One of the unpublished Bengali stories regarding the poet Kalidas is this. He was a great blockhead before the Muse smiled on him. Now the princess of the country was very learned, and challenged all the Pandits to hold dispute with her in the *Sāstras* in which they got invariably worsted. To be revenged on her they searched high and low for a stock blockhead and finding Kālīdāsa who was cutting away the branch of a tree on which he was sitting chose him as her match. When



the Princess met Kālidāsa she raised one finger meaning that God is one. Kālidāsa thought that the woman insulted him by pretending to chastise him with one finger, and to show that he would do the same to her, raised two fingers. The princess understood this to mean that there were *Purusa* and *Prakṛti*, that is two. She showed him the palm of her hand with all the fingers outstretched, meaning that the five elements went to compose everything. Thinking that the princess meant to slap him with her five fingers outstretched, he shook his fists at her and made a whirling motion with the hand. The princess understood that Kālidāsa showed that the entire *śāstras* were in the fist of his hand, and he knew the *tatva* of the whole universe.

Cf. the '*Mahā-ummagga-jātaka* (No. 546. Camb. trsln. Vol. VI, p. 240) where there is no misunderstanding. The religious woman asked Bodhisatta a question by a gesture of the hand. She opened her hand. He clenched his fist. The meaning is "Is the king open-handed to you?" The reply is "No, he is close fistcd."

### 23. FOLKLORE OF THE SANTAL PARGANAS.

#### LXXXVIII. *Sit and Lakhan.*

A Raja had two sons born of his first wife, named Sit and Lakhan. Their mother died. They were hated by their step mother. She pretended to be ill, and when no medicine could cure her, she said that she would be well if she could get to eat the livers of Sit and Lakhan. The Raja asked his Sipāhis to take the princes to the jungle, kill them, and bring him back their livers. The Sipāhis left the princes in the jungle, killed two dogs and brought their livers to the Raja. The Rani ate them and sat up on her bed cured. The two brothers wandering in the jungle sat under a tree in which a pair of birds had a nest. A snake went up the tree to eat the young birds, but it was killed by the brothers. When the parent birds returned the grateful nestlings asked them to give the boys some food. They threw down two bits of food. Whoever would eat the first piece would marry the daughter of a Raja, whoever would eat the second piece would spit gold. Sit ate the first and Lakhan the second. Next morning a royal elephant appeared with a flower, offered it to Sit and carried him away to the Raja who married his daughter to him. Lakhan was at last found to be living in the house of a potter who would not part with him as he spat gold, but when he was amply compensated he was let off and the brothers were re-united.

## A.—(Other Parallels).

*Cf. in the F. T. Bengal the story of Swet Basanta (pp. 96 ff).*

A merchant's son had two sons, Swet and Basanta: and when their mother died their father married another wife. A fish was brought to the house; if anybody ate it he would drop pearls if he wept: and *māniks* (gems) if he laughed. The step mother wanted to have Basanta killed. Swet's wife told her husband the wonderful properties of the fish which the two brothers ate and all three fled into the jungle. Here Swet's wife gave birth to a son. In order to warm the babe Swet went out in search of fire (cf. story of Kuhuk Mandal in *F. T. Orissa*) when all of a sudden a gaily caparisoned king-maker elephant placed him on his back and made him the King of the country who died overnight. Swet entered the queen's chamber at night but kept awake. The queen was sleeping, and at midnight a thin thread came out of her nostril and soon assumed the shape of a huge serpent. Swet cut off the head of the beast, and surprised everybody who thought he would be dead. Meanwhile Basanta sat waiting for his brother to return with fire. A merchant passing in a boat landed and seeing heaps of *māniks* and pearls by the side of Basanta made him captive and brought him to his country where by scourging him to tears and tickling him to laughter he got rich immensely. Swet's child was kidnapped by a kotwal, and the disconsolate mother was saved from committing suicide by a Brahman who adopted her as his daughter. The kotwal's son wanted to marry the Brahmin's daughter, but this incest between the mother and the son was averted by the Brahman who overheard the conversation between his calves. All were united in the end.

Cf. Dr. Dinesh Chandra Sen's *Folk-literature of Bengal* (1920), pp. 165–193; and compare with it in the *Tales of the Panjab* the story of *Two Brothers* for incidents of eating of the mystic fowls, the king maker royal elephant; the ship detained by calms and the human sacrifice to start it, the younger brother's marriage to a princess or a merchant's daughter, his overthrowing into the sea and rescue by his wife. For starting the vessel Cintā's touching the ship may be mentioned.

Cf. Knowles' *Tales of Kashmir* stories of *Two Brothers*, and *Four Princes*; *Hatim's Tales* (VIII. The Tale of a king).

## 24. FOLKLORE OF THE SANTAL PARGANAS.

LXXVII. *The Wife who could not keep a Secret* (a).LXXXVIII. *The tell-tale Wife*. (b).

(a) A Goala learnt from the calf of his cow that at a particular place lay hidden four pots of rupees: he wanted to see if his wife could keep the secret. So he made up a tale that the Raja had a tortoise in him, and asked his wife to cook him some food so that he might go and look at it. His wife went out to fetch water and in a short time the secret had become a public property.

(b) A wife asked her husband what lay in the pot which he hung from the roof. In order to test her if she could keep the secret he said: "The head of a man I have murdered. Keep the news a secret, or my life will be forfeit." One day they quarrelled and the wife informed the headman what lay hidden in the pot.

A.—(*Other Parallels*).

*Cp. Jat.* 546. "*The secrecy of a Secret is always good.*"  
 "'The wise Mahosodha must be slain' if you told this last night secretly to your wife, your secret was disclosed and I heard it"

Cf. p. 152, Schiefner and Ralston's *Tibetan Tales* where Mahaushadha in order to test whether his wife, the king's daughter, could keep the secret told her falsely that the peacock he gave her was the missing peacock of the king and asked her to cook it for him and that he was intimate with such and such a wife of the king's. She disclosed it to her father. Cf. also Rappoport, *op. cit.*, pp. 72ff.—*The Three Brothers*.

## 25. FOLKLORE OF THE SANTAL PARGANAS.

LXXIX. *The Raja who went to Heaven*.

A Raja saw one day, after his bath as he was walking about and looking at his trees on the bank of his tank, that a maiden climbed the tree which was then carried up to the sky. But in the evening he saw the tree in its place again. This happened for four days running. One day the Raja climbed the tree in advance and then when the maiden climbed the tree he was also carried up to the sky along with it. The maiden descended and joined the dance of Gupinis, and the Raja did likewise. He was absorbed in the dance, the tree disappeared and he was stranded. He then went back to the earth with the help of the tree when it next appeared.

## A.—(Other Parallels).

For the magic banyan tree which carried a maiden up into the sky and by which he himself went to heaven see in Kincaid's *Tales of old Sindh* the story of *Prince Amul Mānik* and the *Princess Husini* and the pipal tree which carried the Prince to Dev Suphed's garden.

## 26. FOLKLORE OF THE SANTAL PARGANAS.

LXXXIII. *The Sham Child.*

The elder Rani who was childless was sent by the Raja to live in a palm leaf hut. Listening to the advice of her maid servant she tricked the Raja into believing that she was five months with child. The Raja relented and made a house for her. He was informed in proper time that a boy was born. After sometime they got the price for making some anklets with bells for the prince to wear. When the Raja passed by her house the Rani rattled the anklets to convey the impression that the child was running about. But he was never given an opportunity of seeing the prince. A bride was selected by the Raja for his supposed son and a day fixed for the wedding. At the time of starting for the bride's house, the maid servant made a paste of ground *mahua* flowers and out of this fashioned an image of a child which she carried in a palki. The procession stopped for the night at a bazar where there was the shrine of a saint. The maid servant went to it and asked the spirit (*bonga*) who dwelt there that he must grant her a boon else it would be the worse for him (she would spit and curse) pretending that her son was changed into a paste which he should convert into a boy. This was done.

## A.—(Other Parallels).

*Cf. the story of the Wax Prince in the Orient Pearls (pp. 20-28).*

The king was sad for he had no heir. The queen to cheer him said that she would present him with an heir. She pretended that if the king looked upon the child it would die. She lived now in a separate place, and all along shammed that the child was born, he grew up, a tutor was engaged and so forth, which she managed by bribing. The king thus lived in a fool's paradise. Now a day was fixed for the Prince's wedding. The queen was mortally afraid lest her deception might be detected. She made a wax figure of a prince beautiful and life like, which he put into the palki, asking the king never to look in. When the procession halted on the river bank, and the door

of the palki was left ajar, a snake coming out of the river crept into the palki, and having got inside the figure animated it. It was a mystery to all, but when the mother of the prince advised, her daughter-in-law insisted on knowing who he was, he entered a river and showed that he was a snake.

*Cf. the story of "the Cat who became a queen" in the Folk-Tales of Kashmir.*

The queens having no children adopted a kitten and shammed throughout that a princess was born, she grew up and so forth. The Brahmins were said to have declared that the princess must not be seen by her father till she was married. He was kept informed of her beauty. The king selected a handsome prince as her bridegroom. Fearing lest their deceit would be discovered by the king, they disclosed everything to the prince and begged him to keep the secret which he did. He carried away the cat with great solemnity. At the intercession of Parvati with Siva she was changed into a beautiful woman. *Cf. Tales of the west Highlands*, vol. II, p. 274.

*Cf. Jātaka No. 445 (Nigrodha Jātaka). Shamming of pregnancy.*

## 27. FOLKLORE OF THE SANTAL PARGANAS.

### CXXII. *The Brave Jackal.*

A goat took refuge in a leopard's cave. When the latter came the goat uttered a mysterious cry '*Hum Pak Pak.*' The leopard thinking that a terrible animal now tenanted his cave fled away. The jackal boasted that he was not at all afraid, and offered to accompany him to the cave. They tied their tails together and as they neared the cave the grisly goat stood up. The leopard took fright and fled for life and dragged the jackal by the tail scraping off all his skin.

A.—(*Other Parallels*).

*Cf. the Bengali story of the goat taking shelter in a tiger's cave. The tiger took fright, the jackal came to his aid and when they approached the cave the goat cried out. "সিংহীর মামা ভম্বোল দাস, বাঘ মেরেছি গঙা দশ" I am maternal uncle of the lion, called Bhambol Das and I have killed forty tigers.* The tiger fled dragging the jackal after him.

*Cf. the Close Alliance in Tales of the Panjab (P. 127) for the tail-tying incident.*

When the pair, tiger and jackal tail-tied appeared, the farmer's wife said politely. "How very kind of you, dear

Mr. Jackal, to bring me such a nice fat tiger. I shan't be a moment finishing my share of him and then you can have the bones." The tiger bolted away full tilt, dragging the jackal behind him—Bumpety, bump, bump over the stones, crash, scratch patch, through the briars.

*Cf. story (No. 29) of two Jackals, a Tiger and a Monkey in JBORS, Vol. IV, pp. 339-42.*

Here the monkey and the tiger reef-knotted their tails and came to the cave tenanted by a she-jackal, who said: "You lazy monkey, I ordered you to bring in seven tigers and you are fetching me only one!" The monkey escaped with slight bruises, as the knot got loose when the tiger ran for his life.

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## 28. FOLKLORE OF THE SANTAL PARGANAS.

### LXXXII. *The Corpse of the Raja's son.*

Chitru suspecting the infidelity of his wife who was visited by a prince lay in wait for him, and killed him. But he was in difficulty with the corpse and began to wonder what he should do to avoid being convicted of murder. So he carried it to the house of two dancing girls of the village and laid it inside. They were in consternation to find the corpse there, and to get out of the scrape called for Chitru who had a fame for cunning. He came, affected surprise, and for a reward carried it and laid it down at the verandah of a *mahajan* who, again, sought his aid to get out of the difficulty. This time Chitru took the corpse and put it in a sitting position in a little patch of brinjals which a koeri had planted. Thinking the corpse to be a thief the koeri pelted it with a stone and found the dead body. As the day broke and there was no chance of shoving it off again, he was sent for trial, but was acquitted as he had acted unwittingly.

#### A.—(*Other Parallels*).

This is obviously an emendation of the story of Kubja and Darji, a Bengali comedy, relating how a hunchback eating too full a meal at the house of a tailor had appeared dead and how the corpse was shifted on from place to place during the night.

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## 29. FOLKLORE OF THE SANTAL PARGANAS.

XXX. *The Raja's Son and the Merchant's Son.*XLI. *The Broken Friendship.*

The son of a Raja and the son of a merchant were great friends. They would not mind their lessons but would play truant from school and waste their time. The Raja tried to break off their friendship, but in vain and ultimately announced a reward to anyone who could separate them. One of the Raja's concubines was resolved to win the reward. One day she met the two boys as they were going out to bathe. The Raja's son was walking ahead and the merchant's son a little way behind; the woman ran after the merchant's son and threw her arms round him and putting her lips to his ear pretended to whisper to him and then ran away. The Prince asked his friend what the woman had told him; the latter denied that she had said anything, but for all his protestations the Prince would not believe him. The Prince flew into a rage, would not eat and drink till his friend were put to death. The Raja asked some soldiers to kill him. They led him to the jungle, let the boy off, killed a lamb, steeped his clothes in the blood of the lamb and showed them to the Prince, who now wanted back his friend, who of course was produced.

In the second story an old woman made two men carry a bed (hung over with a curtain) containing some rotten manure and parade it through the bazar with drum beating, to the place where the sons of the Raja and the Dewan were hunting. The Raja's son peeped inside the curtain, but jumped back for smell. The Dewan's son would not believe it. The woman told that she would tell its meaning to one of them, and then he might tell his friend. She put her arms round the neck of the Raja's son and pretended to whisper. When the Dewan's son asked his friend about it, the latter told him that she only pretended to say but did not really say anything. But he would not believe, and brooding that being a friend he could not have a secret confided to him separated.

A.—(*Other Parallels*) ROMANTIC TALES FROM THE PANJAB.*The Prince and his Vizier* (pp. 246 ff.).

One Bugla being jealous of the Prince's friend desired to sow distrust between them and commissioned an old woman to do it. She rode a litter, covered her face with a veil and asked her bearers to carry her near the Prince whom she beckoned to come near. The Prince sent his friend, on whose neck the woman led her hand and made as though she were whispering to him



something of importance. The Prince urged him to give out the secret which of course he could not, as there was none. The Prince wanted to see his friend's blood which the executioners showed him by killing a tame deer. Bugla now became the Prince's minister instead but being worthless was dismissed and the Prince's friend was ultimately restored to him.

### 30. FOLKLORE OF THE SANTAL PARGANAS.

#### IV. *The cruel Step mother.*

This is a make-up tale of various episodes, all familiar.

(a) A Raja's wife died leaving a young boy. The Raja would not marry first, but then married a widow who would take charge of the child. She was kind to him till she had a child of her own, and then she brought false accusation against him till he was driven off to the jungle.

(For parallels see parallels to story of Sit and Lakhana.)

(b) The boy began to cry; Thakur came down and appeared to frighten the boy in the guise of a leopard, bear, snake and elephant but he would not move.

(Resembles the Dhruva episode.)

(c) A Brahman found him and made him a goatherd. He was named Lela, learned letters, became a scholar, and came upon a love letter from a girl proposing to elope with her lover. Lela eloped with her; she perceived her mistake but was reconciled. They came to a city. Lela became a *muktear*. The Raja thought that as he was handsome his wife would be more handsome and wanted to get possession of her.

(This part resembles an unpublished Behari folktale of which the manuscript is with me, though there are other variations.)

(d) The Raja gave him some task which he was sure would end his life. He asked him to bring the Chandmoni Kusum flower, hoping Lela would be eaten by the ogress who dwelt there.

(This is a very ancient trick in fiction known as the David and Uriah motif). Samuel xi. Cf. *Petavatthu* (Commentary iv, 1, 216-217; iv, 15, 279-280; Jat. 314, iii, 43-48. Story of King Cyrus and Queen Panthea. Dhammapada commentary, Bālavagga. Book V, and *Life and Stories of Pārśvanātha* p. 207 for the following references: Pārśvanātha 6, 1057 ff., Kathākośa, p. 32 ff.; Jacobi, *Ausgewählte Erzählungen in Mahārastrī*, p. 24, u. 14 ff. Hitopodeśa, 1, 8; Kathās, 32, 147 ff.; 34, 10 ff., Jātakas 120, 194, 314, 443. Dhpd. Comm. 5, 1; Kathākośa, p. 13. ff., Nirmala Srāvaka reported by Hertel, *Das Pañcatantra* p. 231 ff., Benfey, *Kleinere Schriften*, vol. ii, p. 101).



(e) His wife told him, that her younger sister was Chandmoni, she would give him the flower when called by name, which she ultimately did.

31. *The Unfaithful Wife* (CII) has for the first part an extremely close parallel in the story of *Price of Peace* in Bocaccio's Decamerone.

32. For *Catching a Thief* (No. XCVIII) see the story of Jihvā in Kāthasaritsāgara.

33. *Spanling and his Uncles* (LXII) and *Mongoose Boy* (LXVII) besides having a Mikir Parallel (see JBORS, XIV, pp. 139 ff.) have an Angami Parallel, in the tale of *The Man who turned Ashes into Rupees* in J. H. Hutton's "*The Angami Nagas*," (1921). For variant see the story of বড় রাম ও ছোট রাম in ঠাকুরমার গল্প by Balai Chand Chatterjee.

I refrain from quoting some parallels which strike the reader as very familiar.

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## Race and Adaptability.

By D. N. MAJUMDAR.

The Korwas whom I want to describe in this paper, find occasional reference in the Census Reports and District Gazetteers as the most primitive we possess in these Provinces. W. Crooke in his monograph on *The North Western Provinces of India*, writes about the Korwas. "They have attained only the most elementary social stage; they have no stable exogamous groups and practically no prohibited degrees in marriage; their houses are of the most primitive type—merely a booth of branches arranged in a circle and fastened roughly together at the apex. The true Korwa neither sows nor reaps; he lives in the forest and with his sharp spud digs up edible roots which with the fruits of jungle trees, constitute his food. He uses the bow and arrow but he kills little game now that wild animals have become much more shy and less numerous. But in the lordly fashion of the jungle dweller he claims the woodland as his own and when he makes over his daughter to the youth of her choice her dowry consists of a mountain side on which she has the monopoly of foraging for food."

In the District Gazetteer of Palamau, the Korwas are described as follows:

"In appearance they have a greater resemblance to the African Negroes than any of the Munda tribes, . . . round faces, very black skin, large mouths, very thick lips and broad flat noses. They are short, thick set men, with deep chests and broad shoulders giving the idea of great power, at the same time they are exceedingly active. Like all wild tribes they are very poor cultivators and subsist upon wild herbs and roots and the produce of the chase."

Such an active and powerful tribe, much more interesting from the cultural point of view are the Korwas of this Provinces who are distributed over the fringes of the Choto-Nagpur Plateau and are at present a dying tribe with little or no ambition in life; scarcely getting a full meal a day and always at the mercy of the money-lenders whose slaves they are for the debts of their forefathers as well as their own.

The primitive substratum of population in India forms nearly 75% of the total population; the number of tribes composing this stock is approximately three hundred and the numerical strength of the tribes varies from 300 to 500,000. Tribes that cannot be enumerated in thousands find no mention in the Census Reports and are either ignored or grouped together with neighbouring tribes or castes by virtue of the religion they

profess to follow or the dialect they speak. So the Census Reports give us practically no information about such tribes and if they give anything, it is impossible to arrive at any conclusion regarding the position of the tribes on the basis of such data.

The Census Reports of Bihar and Orissa of 1921 informs us that the number of Birhors speaking their own dialect has decreased from 1,013 in 1911 to only 258 in 1921. Evidently those Birhors who can talk the gawari Hindi of their Hindu neighbours have been affiliated to the Hindu section of the population. This procedure adopted by the Census authorities has however obscured the actual position of the tribe in its career of elimination.<sup>1</sup> Similarly the Korwas find only a passing reference in District Gazetteers and Census Reports. The total Korwa population in the United Provinces of Agra and Oudh is difficult to gather. They numbered 627 in 1901, since then the Korwas have been ignored as they number only a few hundreds. However, from incidental notices in District Gazetteers and local investigations in Korwa settlements, it may be definitely asserted that they are rapidly thinning out. The Birhors are a dying tribe. The decrease in the ranks of the Birhors during the last decade has reached the appalling figure of nearly 30%. The Todas are also faced with extinction. The Tasmanians have already paid the price of modernisation. The race has disappeared.

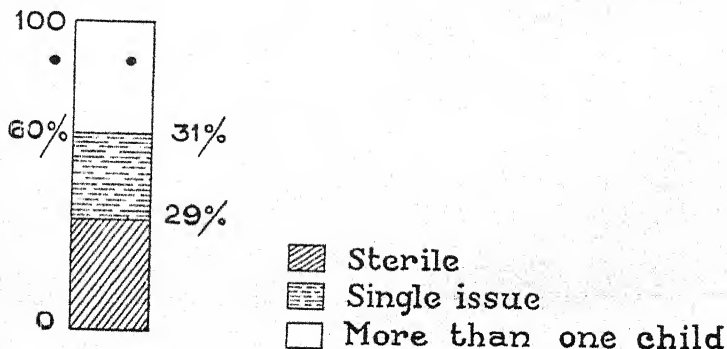
The causes of tribal extinction are still unknown or indefinitely known. No systematic attempt has as yet been made to explain the causes of maladaptation of the tribal stock. The Census authorities are silent about the cases of tribal depopulation. They do not consider it necessary even to attempt an explanation of the factors that lead to the disappearance of races and tribes beyond an indication of this trend. This and similar facts, however, make it all the more evident that it is imperative in the interest of science as well as for safeguarding minority interests that an ethnographic survey of the tribal population in India should again be undertaken along with the coming Census,—so that the actual position of the tribal population in India and the factors that are leading to a decrease in their ranks may be brought to light and remedies suggested.

If the rapid disappearance of the primitive tribes is one of the inevitable results of the progress of civilisation and if it is due to the change from the free and unfettered life of the jungle tribes to a so-called ordered existence or a life of degraded serfs—which have been more or less responsible for a complete change in their mental outlook, it is all the more essential that the factors of this civilisation should be analysed and some sort of protection should be provided for, in order to

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<sup>1</sup> Roy-Birhors.

enable them to hold their own against the onslaught of foreign ideas. The factors of maladaptation are many and local or geographical conditions generally exercise a dominating influence on the social and economic life of the inhabitants. We shall have occasion to discuss this aspect of the question in detail below. Generally speaking, when the death rate gradually overtakes and exceeds the birth rate, there is a decline in the ranks. But low mortality fails to check the course of decline when the tribe or group develops a high sex ratio. In other words when the proportion of male largely exceeds the female population or when the number of males is exceedingly small compared to the females and when the disturbed balance of the sexes does not lead to polyandry or even polygyny a low mortality rate does not help the tribe to adjust itself to any appreciable change of environment. The factors that are regarded as of great significance in hastening the exit of races and tribes are imported diseases, high sex ratio, abortion, loss of ambition in life and apathy to tribal traditions and established usages. But the part of each factor of elimination in shaping the destiny of a group or tribe has proved to be a bone of contention and seldom two authorities are found to agree. To these factors may be added another, *viz.*, inbreeding which amongst the Korwas at least is not only exercising a baneful influence on their social and economic life, but is also sapping the life blood of this hardy stock. Amongst the Korwas there is practically no prohibited degrees in marriage and inbreeding has been carried to the limit. On a first hand enquiry into Korwa settlements it transpired that 29% of the marriages are sterile, about 31% of the marriages have produced single issue while the maximum number of children to a family was found to be five. The sex ratio is approximately 5 : 3; the toll of deaths due to imported diseases is also considerable and witch doctors are employed to drive epidemics from one village to another. Still births, deformity and affected brains are also noticeable.



Due to restrictions imposed on their free and unfettered life by the forest rules, the Korwas like all other jungle tribes are not allowed the free use of the forests. Formerly they organised hunting bands and made inroads into the densest part of the forest, where besides a successful bagging of games, they could procure fruits and roots which supplied them enough nutriment. With the stoppage of this free source of food supply, they had to fall back upon the resources of their rocky land while their crude attempts at cultivation could not supply them an easy means of livelihood. Nor could they supplement their crude farming by the produce of the forest for their weapons of offence and defence, their dexterity in shooting with bows and arrows were of no avail in the thick forest as chasing or killing the wild denizens of the forest was not encouraged. Fruits and roots of the forest which offered them sustenance during frequent crop failures are only available in the densest part of the forest and the people dare not seek them for fear of ferocious animals as also of crossing the fire line demarcated by the forest guards. The rapid deforestation of the Chota-Nagpur area which has been responsible for stringent forest rules, and the consequent diminution of the supply of game and forest produce, are cited as important causes of depopulation amongst the Birhors.<sup>1</sup> The forest authorities foresaw this possibility for in the report of the forest administration we find "the advance of civilisation must mean either extinction or absorption into a population possessing a stronger vitality. . . . It is evident that with the restriction of the large areas of forest over which these tribes are wont to roam and the resulting diminution in the supply of food that the forests can afford, the formation of village communities possessing permanent cultivation must gradually ensue and though in the first instance such villages are self-sufficient even to the smallest detail of domestic requirements, yet in time many savage customs and arts no longer necessary in a settled life will entirely disappear."<sup>2</sup>

The possibilities indicated by the forest authorities are two-fold. The change of environment and mode of life brought about by the restrictions imposed on their otherwise free life may mean either an extinction or absorption into a population possessing a stronger vitality. Those who are acquainted with some aspects of primitive life must realise how difficult it is to assimilate an endogamous tribe with a tribe of greater vitality. Even tribes that recognise genetic relationship between themselves will seldom permit intermarriage between members belonging to two cognate branches of the same tribe. The Hos and the Mundas belong to the same stock and the traditions of both the tribes confirm their affiliation. But it

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<sup>1</sup> Roy-Birhors.

<sup>2</sup> Imperial Gazetteer IV.

is practically absurd to think of an intermarriage between members belonging to these two tribes and the council of elders of both these tribes will vehemently resent any such breach of tribal usage. Instead of any such absorption, there is an incessant tendency to fission into endogamous subdivisions and a consequent likelihood of a close inbreeding in the group, the result of which is a gradual disappearance of the tribe. True, there are cases when changes of custom, manners and traditions and the mode of life have ushered a new era of progress amongst certain section of the tribal population in India as for instance, the Polias or Rajbansis of northern India. But the Polias or Rajbansis are not in the tribal stage, nor do they represent a pure ethnic type.

They are a mixed people, the result of a miscegenation between the Mongolians and the Dravidians brought about by a contact of centuries of which history has records to show. Even if a tribe merges itself into another possessing greater vitality, what proof can we produce to show that the original elements of the weaker tribe have profited by the miscegenation and have not disappeared under the stress of more active and vital forces? Permanent absorption means extinction unless the identity or individuality of the tribes forming a mixed type is maintained. The identity or individuality expresses itself in the process of convergence which brings out clearly the distinct elements which have combined to form an uniform or homogenous type. Everywhere in the United Provinces amongst all castes and tribes there is found two distinct physical types, one resembling the Dravidian ethnic type, the other type approximating to the Indo-Aryan physical features which no doubt indicates a miscegenation between the two dominant racial types. The convergence of types becomes manifest when the mixture is between two races or groups on quite a large scale. In case of mixture of a dominant type with a dying one, the tendency is to assimilate the physical traits of the inferior type so that convergence if there be any is hardly discernible. But before any such miscegenation takes place, it is necessary that an atmosphere should be created which will make it feasible for two types to intermarry and fuse into one. The atmosphere may be created in a number of ways. This is possible when two tribes or groups possessing equal vitality or equal social status or cultural level, living in the same cultural environment mix together on equal terms. This is also possible when a conquering people settle down amongst the conquered possessing a superior culture to that of the conquerors, so that they can mix on equal terms. The muscular superiority of the one is balanced by the mental superiority of the other. As an instance of the latter may be cited the racial intermixture between the Indo-Aryans and the Dravidians. The

Indo-Aryans when they came to India did not possess a higher culture than the Dravidian inhabitants of India. The racial miscegenation was only possible because the two races could sink their differences and meet on equal terms. The Indo-Aryan population of the United Provinces, could reach the pinnacle of cultural evolution because here on the sacred banks of the Ganges they could mix freely and on almost equal terms with another race though not possessing the same physical vitality but certainly enjoying a higher and nobler culture to which the invaders had to bow.

When a race or tribe does not merge itself into another race or tribe possessing greater vitality, yet prepares for an exit it may be taken for granted that there is something wrong in the process of adaptability. Races and tribes are constantly adapting themselves to the environment for failure to adapt means gradual elimination as has been the case with the Tasmanians. The process of adaptability includes positive as well as negative factors. A year of plentiful harvest to a starving tribe may be taken as a positive factor of adaptability while scanty production or crop failure in the case of an agricultural tribe means starvation and therefore a negative factor. Adaptability differs in different communities and in different geographical or ecological areas. Dances are favourite pastimes of the aboriginal tribes. When a tribe is free from economic stress, animated dances become a regular feature of tribal life but when games become scarce or pasture lands fail to supply forage for the cattle or crops fail, naturally enough there is a loss of vitality in tribal life consequently a loss of interest in the dances. So participation in tribal dances may be regarded as a derivative factor of adaptability for it is dependent on economic factors.

The sum total of positive and negative factors or in other words the resultant of these factors of adaptability determines the curve of the numerical strength of a given population, a tribe or a race. When negative factors preponderate the birth rate suffers a check, death rate overcomes or exceeds the birth rate and in the event of the latter, the tribe disappears. When positive factors are in excess of negative elements, the prosperity of the tribe is manifested in the excess of births over deaths and a progressively healthy and cheerful outlook on life acts as a miracle fostering a genial current of the soul which fits it more to fight the battle of life or to adjust it to any change of environment. Again, the factors of adaptability may be direct or indirect. The direct factors are mostly physical ones, indirect ones are those which result in cultural miscegenation. Both these are required for the survival of a race. The direct ones are of immediate concern to the people while indirect ones are not remote for they hasten the operation of direct factors. Physical agony, starvation or



disease are direct factors, exploitation by the mahajan, exaction of landlords or their revenue agents, introduction of social and sexual vices by pioneers of modern civilisation are indirect factors but no less important for they affect the immediate wellbeing of the race.

When a race or tribe cannot adapt itself to a changed environment, it is apparent that something is wrong in the process of adaptability. The jungly Birhors have fallen on evil days with the gradual extension of cultivation and the greater drain on the forests from the presence of a thicker population and they are taking up settled work as landless labourers. Sometimes, they rear a scanty crop of maize or beans by burning a patch of jungle, scratching the soil and sowing on ashes. But the prospect of their becoming settled agriculturists is still remote and it is doubtful whether they will at all take to permanent cultivation before they are extinct for they hold their lives on slender terms.

To the Korwas like all other jungly tribes, the forest with its abundant possibilities has been transformed into a *terra incognita* and they have to remain content with the rocky land where they are trying hard to eke out their livelihood by the sweat of their brow. The poor breed of cattle they possess are unable to drag heavy ploughs, so miniature ploughs are used which can only scratch the soil, not to speak of any intensive attempts at furrowing. The rivers and rivulets which divide and diversify the rocky plateau do not supply them water to drink so no irrigation is possible. The average depth of water is very great and before it can be met with granite rocks have to be pierced. According to the report contained in the District Gazetteer of Mirzapur, large sums of money have been spent by the Government on sinking wells and constructing tanks and embankments mostly in the vicinity of the headquarters of Dudhi Tahasil, but these do not improve the water supply for they fail in dry seasons owing to the porosity of the soil. As pasture lands cannot be had in the vicinity of hamlets, the cattle are taken to the forest for grazing. The forest rules do not recognise the right of grazing cattle in every forest—so sometimes the cattle have to be taken miles away and they are not brought back home every evening. So the excreta also cannot be used to manure the soil. As is but natural, they scratch the ground, sow seeds and offer prayers and sacrifices to the rain god on whose bounties their existence depend. They plough their lands for two to three years at the most and then keep them fallow for say five to seven years.

The scarcity of water, the want of manure, the inhospitable nature of the soil and the crude farming cannot yield a plentiful harvest, so they are never self-sufficient as regards their supply of food. Years of continued disappointments due to



scanty production or failure of crops, the exploitation of the mahajan or the money lender, the merciless exaction of the landlords or their revenue collecting agents, the cunning excise shopkeepers of the interior, have gradually deprived the people of every ambition in life.

The fertility rate has therefore suffered a great check and with increasing hopelessness of their future outlook it may be assumed that the curve of population will continue to sink which may eventually lead to a complete extinction of the Korwas. We are told that poverty co-exists with high birth rate. But here we find that poverty is a check to increasing birth rate. This has also been possible due to the knowledge of herbs and plants which the Korwa women possess or which their husbands have taught them.

Instances are not rare when a sort of protective administration of the tribal territories has led to favourable growth of the tribal stock. We plead for the same treatment to the Korwas and other primitive tribes of India. Crime against trees should be prevented but that should not lead to a crime against man for certainly man deserves greater attention than trees.

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## The Anthropometry of the Bhuiyas of Mayurbhanj.

By PROHASH CHANDRA BASU.

The following account is based on the anthropometrical measurements and observations of 81 individuals taken by me during my tour in the Mayurbhanj State in January-February, 1929.

The Bhuiyas are an aboriginal group of people who have been much influenced by the Hindu civilization, so much so that Oriya has nowadays become almost their mother tongue and every phase of their manners and customs shows an enormous influence of the Brahmanic culture. But still they have preserved many archaic traits of their own and their present culture is in a stage of transition.

The majority of the individuals measured by me belong to Kumastha (tortoise), Nāg (snake), Nagesh (a kind of flower), Bhūi Alu (sweet potato) gōtra (totem). The measurements have been taken in three places, at Baldeha, Pratappur (at a distance of about 10 miles from Baripada, the capital), Kantapar and Bangriposi (about 25 miles from Baripada). The majority of the measurements being from the last mentioned region.

The Bhuiyas are usually dark brown—only one or two individuals are light brown. The colour of the iris is black, two individuals presenting a greyish tint. The hair varies between straight and wavy, rarely curly but never woolly or frizzly.

The supraorbital ridges are moderately developed in the majority, the forehead is usually slightly retreating though it is not uncommon to find complete vertical forehead with ill-developed supraorbital ridges. The root of the nose is somewhat depressed, the nasal bridge being straight. But as a complete idea of the nose form cannot be had from the length and breadth measurements only, the nasal depth, from the subnasal point to the tip of the nose has also been measured.

The eye slits are either straight or oblique and the epicanthic folds are present in a few individuals. These with the prominent zygomatic bones, slight yellowish tinge in the complexion, suggest a submerged Mongoloid strain as suggested by Col. Dalton but denied by others.

The individuals that have been measured are all adults with their ages varying from near about 25 to 50 years.

From an analysis of the metric data we find that—

In their Cephalic Index 34 are Dolicocephalic, 33 Mescephalic, 12 Brachycephalic and only two Hyperbrachycephalic. The average Cephalic Index is 77 and the Standard deviation is  $\pm 4.5$ .

As regards the Length-height Index 63 are Hypsicephalic and only 18 are Orthocephalic. The average Length-height index is 69 and the Standard deviation  $\pm 6.5$ .

On analysing the Facial Index it is found 10 Hypereuryprosopic, 30 Euryprosopic, 24 Mesoprosopic, 14 Leptoprosopic and only 3 Hyperleptoprosopic. The average Facial Index is 84 and the Standard deviation  $\pm 4.4$ .

As regards the Orbito-nasal Index it is found that 42 are Platyopic, 16 Mesopic and only 23 Pro-opic. The average Orbito-nasal Index is 110 and the Standard deviation  $\pm 6.5$ .

The Nasal Index shows 12 to be Leptorrhine, 52 Mesorrhine, 14 Platyrrhine and only 1 Hyperplatyrrhine. The average Nasal Index is 77 and the Standard deviation is  $\pm 8.1$ .

As to Stature 1 Pigmy, 46 Short, 33 Medium and only 1 Tall are found. The average stature is 1577 m.m. and the Standard deviation  $\pm 48.8$ .

If the Cephalic and Nasal Indices are combined we arrive at the following results :—

5	Dolicocephalic	Liptorrhine.
20	„	Mesorrhine.
9	„	Platyrrhine.
4	Mesocephalic	Leptorrhine.
26	„	Mesorrhine.
3	„	Platyrrhine.
3	Brachycephalic	Leptorrhine.
8	„	Mesorrhine.
3	„	Platyrrhine.

No attempt has been made here to compare the Bhuiyas with the kindred tribes of the region as adequate data on the latter have not been available. It is proposed to continue this investigation further when a comprehensive account of the physical characters of the entire group of the tribes of the locality will be attempted. The detailed measurements and observations taken by me, except some that have been mentioned before are given below :—

## BHUIYAS OF MAYURBHANJ.

Name.	Head Length.	Head Breadth.	Head Height.	Bifrontal Diameter.	Milium Frontal Diam.	Biorbital Breadth.	Bizygomatic Diam.	Nasion Menton Height.	Biorbital Nasal Arc.	Nasal Length.	Nasal Breadth.	Nasal Depth.	Stature.	Interorbital Diam.	Cephalic Index.	Nasal Index.	Alveolar Index.	Facial Index.	Orbital Nasal Index.	Forehead.	Eye Slt.	Shape of Face.	Brow ridges.	Remarks.
1. Baya Naik	190	144	120	94	103	105	129	113	105	52	42	16	1513	..	75.7	80.7	63.1	87.6	100.0	S.R.	S.O.	Pent.	+	Hint of Ep. fold
2. Baidyadhar	186	143	148	94	98	105	132	111	105	48	36	21	1562	..	76.3	75.0	79.5	84.0	100.0	Ret.	St.	Pent.	+	Iris Greyish.
3. Mangru	187	142	131	92	99	101	135	114	125	41	38	17	1678	34	75.9	92.6	70.0	84.4	123.7	S.R.	S.O.	Pent.	+	
4. Balvadra	188	146	122	108	99	103	134	115	125	50	35	21	1524	..	77.6	70.0	64.9	85.8	121.3	S.R.	St.	Pent.	+	
5. Raghunath	192	142	136	96	106	104	132	108	110	52	43	17	1601	..	78.2	82.7	70.8	81.8	105.7	Vert.	St.	Pent.	+	
6. Kasi Naik	203	146	127	100	109	111	133	108	115	48	41	20	1580	34	73.0	85.4	63.5	81.2	103.6	S.R.	St.	Pent.	+	
7. Bhagaban	180	153	142	97	106	117	132	118	125	56	37	23	1605	34	85.0	65.0	78.8	89.3	106.8	S.R.	St.	Pent.	+	
8. Ganga ..	185	141	121	104	98	93	127	113	120	59	43	23	1669	30	76.2	72.8	76.2	88.9	129.0	S.R.	St.	Oval.	+	
9. Mouna ..	187	147	140	100	109	109	143	114	120	55	41	22	1626	38	78.6	74.5	74.8	79.7	110.0	S.R.	St.	Pent.	+	
10. Gour ..	193	135	114	99	107	110	133	116	115	51	38	18	1567	34	69.9	74.9	59.0	87.2	104.5	S.R.	St.	Pent.	+	
11. Kartik ..	180	145	123	90	109	102	132	101	110	48	38	18	1546	20	78.0	79.1	66.1	76.5	107.8	Vert.	St.	Pent.	N. P.	
12. Pennab. ..	175	142	118	103	108	105	132	102	120	50	36	16	1654	34	81.1	72.0	67.4	77.2	114.2	S.R.	St.	Sq. O.	+	
13. Utam ..	179	138	106	99	91	99	128	111	115	39	37	19	1511	35	76.7	62.7	59.2	86.7	116.1	S.R.	St.	Pent.	+	
14. Ganeswar	192	140	123	105	95	101	130	106	115	50	42	20	1529	28	81.0	84.0	81.0	81.6	113.8	S.R.	St.	Pent.	+	
15. Udainath	192	140	113	95	96	104	131	111	115	51	32	17	1639	30	72.9	62.7	58.8	84.7	110.5	S.R.	St.	Pent.	+	
16. Sambhu. ..	193	145	145	88	99	109	136	119	105	53	36	17	1640	32	75.1	67.9	75.1	87.5	96.3	S.R.	S.O.	Pent.	+	
17. Kunja ..	185	141	120	96	94	97	137	108	110	52	31	17	1582	33	76.2	60.0	64.8	81.2	113.4	S.R.	St.	Pent.	+	
18. Baistam	185	145	143	92	102	107	137	106	120	45	39	16	1592	32	78.3	87.7	77.3	77.3	112.1	S.R.	St.	Pent.	+	
19. Rubia ..	185	133	131	95	96	90	127	107	105	48	36	19	1542	32	71.8	75.0	70.8	84.2	116.6	S.R.	S.O.	Oval.	+	
20. Goutam	177	137	138	102	93	91	127	118	110	51	37	18	1550	31	77.4	72.5	77.9	92.9	120.8	S.R.	S.O.	Pent.	+	
21. Jagabandhu	183	144	177	97	94	95	130	102	105	48	36	18	1515	27	78.6	75.0	96.7	78.4	110.5	S.R.	St.	Pent.	+	
22. Gura	185	139	116	100	100	95	125	112	100	50	40	18	1649	25	75.1	80.0	62.7	89.6	105.2	Vert.	St.	Pent.	N. P.	

## BHUIYAS OF MAYURBHANJ.

Name.	Head Length.	Head Breadth.	Head Height.	Biognathal Diameter.	Minimum Frontal Diameter.	Biognathomatic Diameter.	Nasion Menton Height.	Biorbital Nasal Arc.	Nasal Length.	Nasal Breadth.	Nasal Depth.	Stature.	Interorbital Diameter.	Cephalic Index.	Nasal Index.	Altitudinal Index.	Facial Index.	Orbito Nasal Index.	Forehead.	Eye Sift.	Shape of Face.	Browridges.	Remarks.
23. Gourhari	181	143	131	101	104	105	131	111	125	50	38	20	1522	34	79.0	76.0	71.8	84.7	119.0	S.R.	Pent.	+	
24. Samma ..	172	114	155	100	95	95	127	115	102	47	39	19	1580	31	66.2	83.0	90.1	91.3	107.3	S.R.	Pent.	+	
25. Sudarsan	181	148	132	95	101	100	130	115	108	51	38	18	1518	32	81.7	74.5	72.9	88.4	108.0	S.R.	Pent.	+	
26. Sukra ..	189	138	113	95	94	96	120	108	102	53	38	16	1538	31	76.0	71.7	59.7	90.0	106.2	S.R.	Pent.	+	
27. Brindaban	183	139	132	100	103	103	129	128	115	60	40	18	1436	29	76.0	66.6	72.1	99.2	111.6	Vert.	Sq. O.	N. P.	
28. Sarna ..	181	144	126	90	98	93	130	105	110	49	39	18	1619	30	79.5	79.5	69.6	80.7	118.2	Vert.	Pent.	+	
29. Chandra	182	142	123	93	99	98	127	107	105	49	38	16	1580	29	78.0	70.3	67.7	87.8	112.2	Vert.	S.O.	+	
30. Agru ..	184	136	113	94	98	98	127	107	105	49	38	14	1537	31	73.9	77.5	61.4	84.2	107.1	Vert.	Pent.	+	
31. Kosa ..	195	145	123	92	103	93	128	107	105	49	34	14	1537	35	74.3	69.3	63.1	85.1	112.9	Vert.	Oval.	+	
32. Gura ..	178	131	123	89	100	99	127	107	105	46	36	16	1533	30	73.6	78.2	69.1	84.2	106.2	S.R.	Pent.	+	
33. Sambu	179	140	131	108	100	98	131	107	118	47	38	18	1566	28	78.2	80.8	73.1	81.6	120.4	S.R.	Pent.	+	
34. Nidhi Charan	186	137	119	96	96	93	130	106	108	49	38	15	1559	30	73.6	77.5	63.9	81.5	116.1	S.R.	Pent.	+	
35. Rubia ..	182	143	126	100	102	101	128	104	113	47	39	18	1630	30	78.5	83.0	69.2	81.2	111.8	Vert.	Oval.	N. P.	
36. Sona ..	183	132	117	100	95	106	133	111	115	43	39	19	1616	36	72.1	90.7	63.9	83.4	108.4	S.R.	Pent.	N. P.	
37. Sonatan	181	135	125	106	96	102	132	112	110	45	39	18	1572	31	74.5	86.6	69.0	84.8	107.8	Vert.	Pent.	+	
38. Ramchandra	167	142	127	..	96	99	130	107	105	49	36	19	1627	32	85.0	73.4	76.0	82.3	106.0	Vert.	Pent.	+	
39. Dasaratha	178	141	129	..	97	96	122	101	105	42	37	17	1530	26	79.2	88.0	72.4	82.7	109.3	S.R.	Pent.	+	
40. Gura ..	190	143	134	..	104	107	131	106	115	39	40	17	1572	36	75.2	102.5	70.5	80.9	107.4	Vert.	Pent.	N. P.	
41. Madhu ..	162	139	123	..	101	107	139	119	115	53	39	19	1589	35	72.4	73.6	64.0	85.6	107.4	Vert.	Oval.	N. P.	
42. Mangru	194	140	122	..	102	103	133	123	115	52	39	16	1613	34	72.1	75.0	62.8	82.4	111.6	S.R.	Pent.	+	
43. Siva ..	180	133	121	99	80	97	129	105	100	46	41	20	1520	31	73.8	89.1	67.2	81.4	103.0	S.R.	Pent.	+	
44. Kamo ..	174	144	142	93	98	101	129	100	105	42	34	17	1532	28	82.1	80.9	81.6	77.5	103.9	Vert.	Pent.	N. P.	

Ep. fold present.

## BHUIYAS OF MAYURBHANJ

Name.	Head Length.	Head Breadth.	Head Height.	Bigonial Diameter.	Minimum Frontal Diameter.	Biorbital Diameter.	Bizygomatic Diameter.	Nasion Menton Height.	Biorbital Nasal Arc.	Nasal Length.	Nasal Breadth.	Nasal Depth.	Stature.	Interorbital Diameter.	Cephalic Index.	Nasal Index.	Altitudinal Index.	Facial Index.	Orbito Nasal Index.	Forehead.	Eye Site.	Shape of Face.	Browridge.	Remarks.
45. Bhagaban	178	136	114	95	94	94	124	106	100	46	33	16	1572	31	76.4	71.0	64.0	85.4	106.3	Vert.	S.O.	Pent.	N. P.	
46. Charan ..	185	143	114	91	99	96	126	109	100	50	35	17	1568	28	73.5	70.0	61.6	86.5	131.2	Vert.	S.O.	Oval.	N. P.	
47. Jagabandhu	198	145	118	98	101	103	136	108	105	47	38	17	1576	35	73.2	80.8	59.5	79.4	101.9	S.R.	S.O.	Pent.	+	
48. Basu ..	176	153	124	101	102	103	136	115	110	47	41	16	1650	29	86.9	87.2	70.4	84.5	104.7	S.R.	S.O.	Pent.	+	
49. Bima ..	176	140	127	95	100	102	132	109	105	45	36	15	1563	29	79.5	80.0	72.1	82.5	102.9	Vert.	S.O.	Pent.	+	
50. Dinabandhu	186	141	116	97	109	99	133	110	115	51	42	22	1538	34	75.8	82.3	62.3	82.7	116.1	Vert.	S.O.	Pent.	+	Ep. fold present.
51. Manmatha	190	148	119	99	106	96	136	112	100	51	43	15	1565	33	77.9	84.3	62.6	82.3	104.1	S.R.	S.O.	Pent.	N. P.	
52. Charan ..	182	136	106	91	97	95	130	110	95	52	32	17	1521	28	74.7	61.5	58.2	84.6	100.0	S.R.	St.	Oval.	+	
53. Budhu ..	180	148	135	93	101	102	137	118	110	54	36	18	1686	35	82.2	66.6	75.0	86.1	107.8	S.R.	St.	Oval.	+	
54. Kalpa Taru	186	144	107	93	110	101	135	115	115	53	39	17	1618	36	77.4	73.6	77.4	85.1	113.8	S.R.	St.	Sq. O.	+	Iris Greyish Brown.
55. Gura ..	181	148	133	95	103	103	131	117	110	50	44	19	1628	30	81.7	88.0	73.4	89.3	106.7	S.R.	St.	Pent.	+	
56. Bhagirathi	174	139	114	100	99	102	130	108	110	54	38	19	1629	32	79.8	70.3	65.3	83.0	107.8	Ret.	S.O.	Oval.	+	
57. Jagu ..	178	139	113	98	97	100	125	112	110	55	42	19	1592	31	78.0	76.3	63.4	89.6	110.0	Vert.	S.O.	Pent.	N. P.	
58. Ugreswar	175	136	134	96	86	93	129	101	105	50	35	18	1584	32	77.7	70.0	76.5	78.3	112.9	Vert.	S.O.	Pent.	N. P.	Ep. fold present.
59. Uddhab Das	179	152	132	100	99	106	137	132	115	50	38	20	1544	34	87.3	76.0	75.8	96.3	108.4	S.R.	Pent.	+		
60. Nabin ..	181	136	134	96	84	103	131	122	110	54	34	21	1670	29	75.1	62.9	74.0	93.1	106.7	S.R.	St.	Oval.	N. P.	
61. Sankar ..	195	140	110	98	90	94	128	104	105	43	39	15	1489	33	71.8	90.7	55.4	81.2	111.7	Vert.	St.	Oval.	N. P.	
62. Mangru	170	139	138	107	97	94	134	94	110	43	38	17	1613	30	81.7	88.3	81.1	70.1	117.0	Vert.	S.O.	Pent.	+	
63. Raghu ..	183	135	126	90	92	96	127	97	107	40	35	15	1527	32	73.7	87.5	68.8	76.3	111.4	S.R.	Sq. O.	Pent.	N. P.	
64. Giridhari	191	141	151	100	95	97	132	118	110	55	39	18	1621	29	73.8	70.0	79.0	89.3	113.4	Vert.	S.O.	Pent.	N. P.	Ep. fold present.
65. Sanatan	170	137	126	94	79	99	128	111	108	50	36	16	1532	30	80.6	72.0	74.1	86.7	109.0	S.R.	S.O.	Pent.	+	
66. Gaya ..	175	134	109	96	80	91	126	199	105	47	34	18	1464	28	76.5	72.3	62.2	78.5	115.3	Vert.	S.O.	Pent.	+	

## BHUIYAS OF MAYURBHANJ.

Name.	Head Length.	Head Breadth.	Head Height.	Bigonial Diameter.	Minimum Frontal Diameter.	Biorbital Diameter.	Trigonomastic Diameter.	Nasion Menton Height.	Biorbital Nasal Arc.	Nasal Length.	Nasal Breadth.	Nasal Depth.	Stature.	Interorbital Diameter.	Cephalic Index.	Nasal Index.	Altitudinal Index.	Facial Index.	Orbito Nasal Index.	Forehead.	Eye Slit.	Shape of Face.	Browridges.	Remarks.
67. Raghumath ..	191	152	130	102	103	97	139	113	110	57	39	21	1805	32	79.5	68.4	68.0	81.3	113.4	Ret.	S.O.	Oval.	+	
68. Kshetra Mohan ..	185	138	111	95	103	96	129	109	105	51	37	19	1634	32	74.6	72.5	60.0	84.5	109.3	Vert.	S.O.	Pent.	N. P.	
69. Lakshmi Dhar ..	178	133	122	105	94	96	131	117	105	53	39	18	1638	32	75.8	73.6	68.5	89.3	109.3	S.R.	S.O.	Oval.	+	
70. Nanda Sing ..	177	136	121	97	104	95	127	116	105	57	39	16	1525	31	76.8	70.8	68.3	91.3	110.5	S.R.	S.O.	Pent.	+	
71. Bhutia ..	181	135	111	96	83	83	96	128	102	43	39	16	1573	33	74.5	90.7	61.3	79.6	109.3	Vert.	S.O.	Pent.	N. P.	
72. Mukunda ..	178	142	123	94	83	97	130	108	106	44	38	19	1663	28	79.7	86.3	61.2	83.0	109.2	S.R.	S.O.	Oval.	+	
73. Bajra ..	195	140	141	110	94	112	135	108	125	55	41	18	1650	34	71.8	74.5	72.3	80.0	111.6	S.R.	St.	Oval.	N. P.	
74. Gaya ..	187	136	135	98	100	97	135	107	110	46	39	18	1537	31	72.7	84.8	72.1	79.2	113.4	Vert.	Sq. O.	Sq. O.	N. P.	
75. Manglu ..	181	148	131	90	95	88	126	111	105	50	36	18	1616	23	81.7	72.0	72.3	88.0	119.3	Vert.	St.	Trian.	N. P.	
76. Kanda ..	183	150	118	104	104	100	138	113	107	50	37	19	1624	30	81.9	74.0	64.4	81.8	107.0	Vert.	S.O.	Pent.	N. P.	
77. Bharata ..	171	139	117	111	98	98	135	111	111	52	36	15	1550	25	81.2	69.2	68.4	82.2	113.2	S.R.	St.	Pent.	+	
78. Panur ..	186	143	124	98	100	94	135	109	105	48	34	17	1560	30	76.8	70.8	66.6	80.7	111.7	Vert.	S.O.	Pent.	N. P.	
79. Samna ..	194	149	132	87	104	99	135	113	105	46	35	18	1584	32	76.8	76.0	68.0	83.7	106.0	Vert.	St.	Pent.	+	
80. Purna ..	187	142	115	100	98	97	132	107	105	48	39	14	1516	29	75.9	81.2	61.5	81.0	108.2	Vert.	St.	Sq. O.	+	
81. Ruhia ..	182	144	126	85	101	97	132	100	105	45	36	15	1540	31	79.1	80.0	69.2	75.7	108.2	Vert.	S.O.	Pent.	+	

Ep. fold present.

N.B.—The measurements are all in millimetres.

Abbreviations used:—

Diam.	=	Diameter.	Pent.	=	Pentagonal.
S.R.	=	Slightly retreating.	N. P.	=	Not prominent.
Vert.	=	Vertical.	+	=	Slightly prominent.
Ret.	=	Retreating.	++	=	Moderately "
S.O.	=	Slightly oblique.	+++	=	Strongly "
St.	=	Straight.	Ep.	=	Epicanthic.
Trian.	=	Triangular.	Sq. O.	=	Squarish Oral.

## STATISTICAL CONSTANTS.

Name.	Head Length.	Head Breadth.	Head Height.	Bigonial Diameter.	Minimum Frontal Diam.	Biorbital Diameter.	Bizygomatic Diameter.	Nasion Menton Height.	Biorbital Nasal Arc.	Nasal Length.	Nasal Breadth.	Nasal Depth.	Stature.	Interorbital Diameter.	Cephalic Index.	Nasal Index.	Altitudinal Index.	Racial Index.	Orbito Nasal Index.
Number ..	81	81	81	76	81	81	81	81	81	81	81	81	81	77	81	81	81	81	81
Average ..	184	140	126	97	98	100	131	110	110	50	38	18	1577	31	77	77	69	84.0	110
Standard Deviation ..	±6.7	±5.0	±12.5	±5.2	±6.6	±5.2	±4.0	±6.5	±6.5	±4.4	±2.6	±1.9	±48.8	±2.8	±4.5	±8.1	±6.5	±4.4	±6.5
*P.E. of mean ..	±.50	±.37	±.93	±.40	±.49	±.39	±.29	±.48	±.48	±.32	±.19	±.14	±3.6	±.20	±.33	±.60	±.48	±.32	±.48
P.E. of Standard Deviation ..	±.35	±.26	±.66	±.27	±.35	±.27	±.21	±.34	±.34	±.23	±.13	±.10	±2.5	±.15	±.23	±.43	±.34	±.23	±.34
Coefficient of Variation ..	±3.6	±3.5	±100.0	±5.3	±6.7	±5.2	±3.0	±5.9	±5.9	±8.8	±6.8	±10.5	±3.0	±9.0	±6.8	±10.5	±9.4	±5.2	±5.9
P.E. of Variation	±.21	±.27	±10.0	±.29	±.35	±.04	±.15	±.31	±.31	±.40	±.58	±.54	±.17	±.50	±.34	±.54	±.47	±.26	±.31

\*P.E. = Probable Error.





**The Satak Copper Plate Grant of King Rāma Siṃha II,  
of Jaintia of 1809 A.D.**

By KUNJA GOVINDA GOSWAMI.

In February last, I was informed, at my village home at Satak, District Sylhet, that one of our neighbours, S<sup>r</sup>. Madan Mohan Goswami had a copper plate inscription in his possession. I at once hastened to his place and saw the plate. The plate records the grant of twenty-four *kedāras* of land in two plots to one, Balarāma Goswāmi (here mentioned as Vaiṣṇavādhikārin), by King Rāma Siṃha II, (1789–1832 A.D.) of Jayantīpura (modern Jaintia) in the North Sylhet subdivision of the Sylhet district, for the worship of Rādhā and Kṛṣṇa under the name of Vrajesvari and Vrajesvara. I am told that this Balarāma, out of aversion towards the world, renounced it and went to the hilly tract of Jaintia for meditation and spiritual advancement. There he founded a temple of god *Viṣṇu* and himself became a *Sevāit* there. Hence probably, he is called a Vaiṣṇavādhikārin here. Very soon he became famous in the locality for his piety and religious austerities and people began to become his disciples. In no time, this news reached the ears of the reigning king, Rāma Siṃha II. He being attracted by the virtues of this holy man, made a grant of the land under discussion besides many other valuable donations. We learn also from the *Sri-hatter Itivṛitta* (The History of Sylhet, Part II, p. 279) by Mr. Achyuta Charan Choudhury that King Baḍa Gosāyi II (1729–1770 A.D.) of Jaintia, invited Rāma Govinda Goswami, one of the ancestors of the donee of this plate, to his capital, learnt *yogāṅgas* (eight constituents or parts of the *yōga*) from him and gave much wealth in the shape of *Guru dakṣiṇā* (preceptor's fee). So we see that there had been a religious influence of the family of Balarāma upon the royal family of Jaintia for a long time, and this grant also bears testimony to this fact. The present holder of the grant, S<sup>r</sup>. Madan Mohan Goswami, is a descendant of the original donee through his brother's line and is still held in high esteem both by the people and the Rājā at Jaintia whenever he goes there. The temple is maintained even now and worship of the deities is carried on by an appointed *Sevāit* who manages the affairs there from the income of the property of the temple.

The plate roughly measures 7" × 4". The inscription opens at the top with the invocatory line "*namo Vrajesvarāya*" preceded by a symbol which seems to be a very late form of the symbol representing *om* according to Hoernle (*Intro. Bower MSS.*

*In. Ant.* reprint, page 22) and Fleet (*Corp. Ins. Ind.*, page 46, n 3) but *Siddhirastu* or *Siddham* according to N. K. Bhattasāli, supported by Krishna Sastri (*Ep. Ind.*, Vol. XVII, p. 352). This symbol is called *āñjī* by the older generation in Bengal. Curiously enough, this sign precedes also the right hand side line of the inscription under discussion. Just below the invocatory line, is engraved the royal seal representing a jumping lion in the midst of a roughly shaped circle. Similar seals with slight variations were now and then used by the Kings of this place. This statement will find corroboration if we compare some other inscriptions of the Jaintia Kings, edited by Dr. K. M. Gupta (*vide* (i) *J.A.S.B.*, 1922, p. 73 f., (ii) *ibid.*, 1923, pp. 323 f., (iii) *ibid.*, 1923, pp. 331 f.).

The plate is in a good state of preservation and every letter is distinct and legible. It contains seventeen lines besides the invocatory top line and two side lines—one to the right-hand side of the plate and the other to the left in the upper margin.

The characters are well shaped Bengali with some peculiarities. The language is Sanskrit prose throughout with the exception of the words *Kiṭāvat* (derived from Arabic and means writing of) occurring on the left hand side, and *Sahi* (probably Perso-Arabic and here perhaps means "signed by,") on the left hand side.

There are a few orthographical inaccuracies due to ignorance and carelessness of the scribe; e.g. (i) in some places *s* (ॱ) has been used for *ś* (ॡ), viz. *saptadāsa-sata* for *sapta-dāśa-sata* (line 8), *disi* for *diśi* (line 10) and *vimsati* for *vimśati* (line 17), (ii) *datvā* for *dattā* (line 9), (iii) *śimāvachchinṇā* for *Śimāvachchinṇā* (line 16). The use of the word *livi* (document) (line 17) is peculiar here. Although both the forms *livi* and *lipi* are correct according to Sanskrit dictionaries, the former is hardly met with in Sanskrit books. Another point we should note here. There is no distinction in the use of *b* and *v* in Bengali, either in writing or in pronunciation. The former is rather frequently used in place of the latter. This observation holds good for the present inscription also. But I have given *v* in its proper places in my transliteration without giving the Bengali *b* first and then changing it to the correct form *v* for the sake of convenience.

Early mention of the tract of Jaintia is found in the Paurāṇic and Tāntric literature as containing one of the famous shrines sacred to Durgā. "It was known as Nārāṇya, mentioned in Jaimini's *Mahābhārata*," says Mr. Achyuta Charan Choudhury in his *Srihatter Itivritta (History of Sylhet)*, Part I, Sec. IV, Ch. I. He being supported by MM. Padmanath Vidyavinoda (*vide Ind. His. Quarterly*, Vol III, No. 4, pp. 848-49) throws a ray of light on a mediæval king of Jaintia by stating that the famous Kāvya, Rāghava Pāṇḍaviya of Kavirāja was composed during the reign of King Kāmādeva of Jayantiāpura in the 11th century A.D. The book itself does not contain any reference to a

definite date and so scholars are not at one with regard to this point. But from the internal evidence we learn that this poetical work was composed by Kavirāja during the reign of Kāma-deva in the city of Jayantiāpura (Canto I, verse 25). And Mr. Choudhury and Mahāmahopādhyāya Vidyāvinoda are inclined to identify this Jayantiāpura with modern Jaintia of the Sylhet district.

According to tradition the ancient rulers of the Jaintia plains were Brahmins by caste. They ruled the region for several generations, and we do not exactly know how they met with their fall. But this much we learn from Sir E. Gait that a group of the Khasi tribes called the Syntengs inhabited and ruled the hilly part, namely, the Jaintia Hills for a long time; and after the fall of the traditional Hindu Kings of the Jaintia plains, a scion of this tribe, named Parvat Ray took possession of the plains about 1500 A.D. (*History of Assam* by Sir E. Gait, New Edition, page 261). After that this small principality had to pass through successive invasions of the Kochas, the Kacharis, and the Āhoms. In spite of these repeated attacks the Synteng line could maintain its own independence for more than three centuries till at last the kingdom was annexed to the British Empire in 1835 A.D. Gait supposes from the nomenclature of the founder of the dynasty and his successors that from this time forward they began to feel gradually the influence of the Hindu religion and finally identified themselves with it in its Tantric form of worship. The Kings with certain laxity in matter of food and drink became champions of Śakti worship in that part of the country; and the holy shrines at Jaintia as also at Fāljur bear sufficient evidence of it. Although the rulers belonged mainly to the Tantric sect, they were patrons of all other branches of the Hindu religion. This statement will be borne out by the fact that Mahādevī Kāsāsati, wife of Bada Gosāyi, made grants of land to the gods Śiva, Jagannātha, Vāsudeva, and Bhūdhara during the reign of Rāma Siṃha II, who is the donor of the plate under review, in the Śaka year 1725 (= 1803 A.D.) (*J.A.S.B.*, 1923, pp. 323-27). That this Rāma Siṃha was also a devotee of Durgā and Śiva is set forth in his Dhupi Copper plate grant of the Śaka year 1720 (= 1798 A.D.) (*J.A.S.B.*, 1922, p. 73). The present plate shows that he had reverence for the Vaiṣṇava deities Vrajeswara and Vrajeswari also. Similarly, instances from Epigraphic and other sources can be multiplied in favour of our assertion. Researches of scholars are now bringing to light many inscriptions which among other things show that the princes of this line have always shown religious toleration. Rāma Siṃha II has been taken by Gait to be the twentieth king in descent from Parbat Ray and his period has been fixed at from 1789 A.D. to 1832 A.D. He was the nephew of his predecessor Vijaya-Nārāyana. It is also important to note here that though the rulers became Hinduised,

society is still matriarchal and the throne passes to the nephew (sister's son) and not to his son after the death of the ruling king.

The plate was issued on the 23rd day of Māgha of the Śaka year 1731 (= which corresponds to February, 1809 A.D.).

#### READING OF THE PLATE.

*Om*<sup>1</sup> *Namo Vrajesvarāya.*

- 1 ekatrimśadadhika-saptadasa-sata<sup>2</sup>-śākābde Śrī-
- 2 majjayantīpura-purandara-Śrīla Śrī Rāma ॐ
- 3 Siṃha nṛpavareṇa Gosāinapurākhyā grāmā-
- 4 ntargata sūtāgrāmāntagatayoś-catur-viṃśa-
- 5 ti kedāra parimitā bhūmiḥ khandadvayena
- 6 Śrīmad Vrajesvarī-Vrajesvarayor-arcanārthaṃ
- 7 Vāṇī vaiṣṇava santataye Śrī Balarāma Vaiṣṇavā-
- 8 dhikāreṇa datvā.<sup>3</sup> Tat prathama khandasya pū-
- 9 rva diśi<sup>4</sup> mahīharanānakhyā bhūḥ, tat paścā-
- 10 t gocarapanthāḥ taduttare āmīra-ghara-
- 11 nākhyā vātikāyāḥ panthāḥ taddakṣiṇe gu-
- 12 lākhyā bhūryyāvat tadvitiyā<sup>5</sup>-khandasya pūrvva-
- 13 diśi<sup>6</sup> bhogākharākhyā bhūḥ, tata<sup>7</sup> paścāt
- 14 naktinānakhyā bhūḥ taduttare mahīharanā
- 15 nākhyā bhūḥ dakṣiṇepyevaṃ itthaṃ catuḥ
- 16 sīmāvachinvā<sup>8</sup> bhūmiḥ māghasya trayaviṃ-
- 17 sati<sup>9</sup> divasiyā libir-iti.

*On the left hand side :—*

Kitāvat Śrī Rāma Majundhāra.

*On the right hand side :—*

Sabi Śrī Vijaya Siṃ Senāpati.

#### ENGLISH TRANSLATION.

*Om* (expressed by a symbol)! *Salutation to Vrajeswara.*

In the Śaka year *seventeen hundred increased by thirty-one*,—land, measuring *twenty-four Kedāras*<sup>10</sup> in two plots (included)

<sup>1</sup> Expressed by a symbol. <sup>2</sup> Read ekatrimśadadhika-saptadaśa śata. <sup>3</sup> Read dattā. <sup>4</sup> Read diśi. <sup>5</sup> Read tadvitiyā. <sup>6</sup> Read diśi. <sup>7</sup> Read tataḥ. <sup>8</sup> Read Sīmāvachinnā. <sup>9</sup> Read—viṃśati.

#### NOTES TO THE TRANSLATION.

<sup>10</sup> In Jaintia as in other parts of the Sylhet district the following land-measurement is in vogue :—

in the villages of *Gosāinpur*<sup>1</sup> and *Sulāra*<sup>2</sup> has been granted by the great King *Rām Siṃha* (who flourished) like *Purandara*<sup>3</sup> (*Indra*) in the city of *Jayanti* (mod. *Jaintia*) to *Balarāma Vaiṣṇavādhikārin*, a descendant of *Vāni* (who is) the devotee of god *Viṣṇu*, for the worship of the deities, *Vrajeswari* and *Vrajeswara*.

Now the land is bounded on four sides as follows: to the east of the first plot lies the land, called the *Mahiharanana*; <sup>4</sup> to the west the path used by the cattle; to the north the path which leads to the house, called *Āmiragharana*; to the south as far as the land called the *gula*.<sup>5</sup> Now to the east of the second plot lies the land called the *bhogākhāra*, to the west the land called the *Naktināna*, to the north the land called the *Mahiharanana*, to the south the same.

The document is written on the *twenty-third day of the month of Māgha*.

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3	krāntis	=	1	kaḍā
4	kaḍās	=	1	gaṇḍā
20	gaṇḍās	=	1	paṇa
4	paṇas	=	1	rekha
4	rekhas	=	1	yasti or jasti
7	yasti	=	1	poā
4	poās	=	1	kedāra, kera, keyāra, kiyāra
12	kedāras	=	1	hāla or hala
		=	10½	bighās
		=	about	3½ acres.

<sup>1</sup> and <sup>2</sup> these villages are still existing and are still known by their former respective names.

<sup>3</sup> The Kings of *Jaintiā* used the title, *Jayantipura purandara* in their coins and inscriptions. (i) cf. *Jaintiapur Copper Plate Inscription* of *Bada Gosāyi*, line 3. *J.A.S.B.*, 1923, p. 332. (ii) A coin from *Jaintipur*, *ibid.*, p. 335. (iii).

<sup>4</sup> *Mahihara*, I am told by an educated gentleman of *Jaintia*, means a surveyor. But I cannot understand what the portion *nāna* in *Mahiharanānākhyā*, and *Naktinānākhyā* actually means. My authority also could not throw any light on that point.

<sup>5</sup> *Gula*, in some parts of *Sylhet*, stands for a plain which is surrounded almost on all sides by hillocks.





## Thucydides II. 13.

## A Possible Explanation of Certain Difficulties.

By K. ZACHARIAH.

Thucydides has put into the mouth of Pericles a sketch of the financial position of Athens at the beginning of the Peloponnesian War, which runs thus:—‘Apart from other sources of income, an average revenue of 600 talents of silver was drawn from the tribute of the allies; and there were still 6,000 talents of coined silver in the Acropolis, out of 9,700 that had once been there, from which the money had been taken for the porch of the Acropolis, the other public buildings and for Potidæa. This did not include the uncoined gold and silver in public and private offerings, the sacred vessels for the processions and games, the Persian spoils and similar resources to the amount of 500 talents. To this he added the treasures of the other temples. These were by no means inconsiderable, and might fairly be used. Nay, if they were ever absolutely driven to it, they might even take the gold ornaments of Athena herself; for the statue contained 40 talents of pure gold and it was all removable. This might be used for self-preservation but all of it must be restored. Such was their financial position—surely a satisfactory one.’ Some<sup>1</sup> of these assertions are perplexing and on the basis of such information as we possess from other sources, chiefly inscriptions, have, in fact, proved impossible to confirm or justify.

The three main points in Thucydides’ account, with which we are concerned, are these: (1) in 431, there were 6,000 T of coined silver and 500 T of uncoined gold and silver in the Acropolis, besides the treasures of the other temples; (2) at one time, there had been 9,700 T in the Acropolis, but a large part of it had been spent on the Propylæa and other public buildings and for the operations round Potidæa; (3) the tribute from the allies brought in on the average 600 T a year.

The first of these statements does not present much difficulty; and it is confirmed generally by the epigraphic evidence. We have, fortunately, the accounts of the logistai containing the totals of the sums borrowed by the State from the temples during the years, 433/2—423/2.<sup>2</sup> Athena Polias, by far the largest creditor, lent over 4,001 T between 433/2 and 427/6 and

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<sup>1</sup> Thuc. II. 13.

<sup>2</sup> Inscriptiones Graecæ (editio minor) = I. G<sup>2</sup>. I, 324.



over 747 T between 426/5 and 423/2. The period, be it noted, begins before 431 and the sums include the loans for the expeditions to Corcyra and the earlier operations against Potidæa; on the other hand, the period ends a year before the Peace of Nicias and the expenses of the last campaign in Thrace are not reckoned. Roughly, we may conclude that the State borrowed about 5,000 T from Athena Polias, that is, practically the whole of the available reserve, as 1,000 T had been set apart by decree for an extreme emergency.<sup>1</sup> Far the larger proportion of this amount was borrowed in the first four or five years of the war and the rapid exhaustion of the reserve is both the explanation and the justification for the imposition of the eisphora and for Cleon's drastic re-assessment of the tribute. Without these expedients, especially the latter, Athens would have been bankrupt long before 421. It is very unlikely that there was any balance to pay into the reserve during any year of the war and in 421 the treasury probably contained little more than the final reserve of 1,000 T. An inscription, however, records the existence of 3,000 T in 416/5.<sup>2</sup> Between 421 and 416, 2,000 T, more or less, were thus added to the reserve. This is not improbable, even though there was a considerable reduction of the tribute in the assessment of 421, as West has shown,<sup>3</sup> and although there is evidence of small borrowings in 418/7 and 417/6.<sup>4</sup>

The statement of Thucydides about the presence of 6,000 T in the Acropolis in 431 may, therefore, be accepted.

The second assertion is, however, not so easily credible. As it stands, the passage implies that 3,700 T had been spent in the years immediately preceding—the Propylæa are mentioned as one of the items of expenditure, but the Parthenon is not mentioned, and we cannot believe that it is included among 'the other public buildings'; the siege of Potidæa is mentioned, but not the siege of Samos. The language of Thucydides suggests that the maximum of 9,700 T was reached about 435 or in the one or two years before or after. But we know that the operations round Potidæa cost altogether only 2,000 T,<sup>5</sup> of which the greater part must have been spent after 431; and, while we have no accurate figures for the expenses of the Propylæa, such evidence as exists suggests a total of a few hundred rather than a few thousand talents.<sup>6</sup> The assumption that 3,700 T was spent from the reserve (not taking into

<sup>1</sup> Thuc. II. 24.

<sup>2</sup> I. G<sup>2</sup>. I, 99.

<sup>3</sup> *Amer. Jour. Arch.*, 1925, pp. 135-151.

<sup>4</sup> I. G<sup>2</sup>. I, 302.

<sup>5</sup> Thuc. II. 70.

<sup>6</sup> The statement of Heliodorus that the Propylæa cost 2,012 T cannot be accepted in view of what we know of building costs. Beloch (*Gr. Gesch.* II, 2, 336) thinks it could not have cost more than 2-300 T. Cavaignac (*L'histoire financière d'Athènes au Ve siècle.* 102) suggests an expenditure of 400 T.

account the annual revenue at all) for the purpose which Thucydides mentions is inadmissible.

It is difficult to believe, then, that Athens had 9,700 T in the reserve about 435. Nor is it possible to discover any earlier date at which we can reasonably assume the existence of this large sum. No year will serve after the conclusion of the Samian War in 439, because the years following were surplus years, during which the Samian indemnity was being received in instalments and there must have been annual balances from the tribute of the empire. Generally speaking, the period between the transfer of the treasury to Athens and the Samian revolt was also a period of surplus budgets. The expenses of the not very protracted expeditions and of the Parthenon must have been far less than the 5-6,000 T which were paid in as tribute during these years. The reserve, therefore, probably reached its maximum in 441. But the maximum could scarcely have been as high as 9,700 T, unless we assume either the existence of several thousand talents at Delos at the time of the transfer of the treasury to Athens or the possession of great wealth by Athens herself derived from other sources—the probabilities are against either hypothesis.<sup>1</sup> On the other hand, if there were 9,700 T in 441, it is impossible to explain how the reserve dwindled down to 6,000 T in 431. The only extraordinary expenses of any magnitude during these ten years were the cost of the Samian siege, the expeditions to Corcyra and to Potidæa, and the buildings, the Parthenon partly and the Propylæa entirely. Against them we have to set the tribute, which by itself was probably sufficient to meet all these expenses, and several instalments of the Samian indemnity. The conclusion appears inevitable that there never were 9,700 T at one time in the reserve.

If this argument is valid, there are only two possible alternative explanations, one or the other of which historians have been obliged to accept. Either our text is corrupt or Thucydides fell into confusion. A summary of the views of three prominent writers on the subject will illustrate these alternatives.

Cavaignac suggests a theory of textual interpolation. He relies on one of the scholia on Aristophanes, which says that there always were 6,000 T of coined silver on the Acropolis, of which the greater part remained, about 300 T having been spent on the Propylæa and other buildings and for the siege of Potidæa; and he suggests that a copyist, who knew the

<sup>1</sup> The figures of Diodorus, 8,000 and 10,000 T, are worthless. Beloch (*Gr. Gesch.* II, 2, 329) thinks there were 3-3,500 T at the time of the transfer. Cavaignac (*Hist. Fin.* 69) suggests 3,000 T. Ed. Meyer (*Forschungen* II, 126) ascribes to Athena large revenues and a great hoard of her own; but Beloch's and Cavaignac's criticism of this theory seems sound.

tradition of 10,000 T, made a slight alteration so as to make the passage mean that there were still 6,000 T in the Acropolis, the maximum having been 10,000 T less 300 T, on which one had drawn for the Propylæa and other buildings and for the siege of Potidæa. Thus we have the figure of 9,700 T in our existing MSS. of Thucydides.<sup>1</sup> The figure, 10,000 T, was certainly current as an estimate of the resources of Athens at their highest; we have mention of it in a fragment of Isocrates as well as in Diodorus. Diodorus says that the treasure brought from Delos, gathered from the common contributions of the cities, amounted to 10,000 T; but 4,000 of them were spent in the building of the Propylæa or citadel and in the siege at Potidæa. 6,000 T remained, as in Thucydides.

This is a possible solution, but hardly probable. It relieves Thucydides of the responsibility of error with regard to the 9,700 T, an amount which, as I have tried to show, the treasury could not have possessed at any one time; but it does not touch the equally difficult problem of the 600 T of tribute. Nor is there any direct evidence for textual corruption. Our MSS. of Thucydides have no variant readings in this passage. And, as Beloch points out,<sup>2</sup> the corruption is more likely to be in the scholium than in the extant text of Thucydides.

Beloch concludes by the remark that here we have an instructive example of the result of the attempt to maintain the authority of Thucydides at all cost. His own opinion is that Thucydides made a mistake; he added to the sums in the treasury in 431 the whole cost of the siege of Potidæa (2,400 T) and the total expenses to the state of the buildings on the Acropolis (1,300 T).<sup>3</sup>

Ed. Meyer's explanation is, in some respects, similar. The 3,700 T, he argues, must have been spent mainly on the Propylæa and other buildings and only in small part on the expeditions. The reserve must therefore have reached its maximum before the commencement of the Propylæa in 437, that is, before the 3,000 T which are mentioned in the decree of Callias had been fully paid in. But, obviously, this cannot be right. What Thucydides did was to reckon this payment as already complete. He is assessing the financial resources Athens had at her disposal at the highest point of her power; it was irrelevant to his purpose that the whole sum was never together in the Acropolis and that by the time the last instalments of the 3,000 T had been received in 434 already considerable sums had been paid out again for expenses.<sup>4</sup>

<sup>1</sup> Cavaignac, *Hist. Fin.*, 107-111.

<sup>3</sup> *Ibid.*, 342.

<sup>2</sup> *Gr. Gesch.*, II, 2, 341.

<sup>4</sup> Meyer, *Forsch.*, II, 119.

It will be noticed that this argument rests on the assumption that the decree of Callias was passed in the year 434. On this decree hang many difficult problems of Athenian financial history with which I cannot now deal; it need only be said that the weight of opinion seems to be in favour of an early date like 434 for this decree rather than of a later date like 418, which is maintained by Beloch.<sup>1</sup>

Let us turn now to the third statement of Thucydides, that the average annual income from the tribute was 600 T. If it is possible that the 9,700 T is the emendation of a copyist—and this is the more easily conceivable as the item is contained in a parenthesis—the same explanation will not cover the 600 T. That the statement existed in early Mss. of Thucydides is clear from Plutarch's quotation of it in his life of Aristides.<sup>2</sup> But that it caused perplexity is also clear from the fact that in the parallel and probably dependent passage in Diodorus the income from the tribute at the beginning of the war is estimated at 460 T, the traditional figure.<sup>3</sup>

Fortunately, we have at this point the direct evidence of inscriptions to check Thucydides. Numerous fragments have been discovered of the stelae on which was inscribed, year by year, the amount of the tribute paid by the allies beginning with 454, or rather, of the *aparche* or sixtieth part of the tribute paid to Athena. Attempts have been made to reconstitute the lists, but the text in the first edition of the Corpus was imperfect and the calculations made on the basis of that text, notably by Pedrolí and Cavaignac, are therefore unreliable and generally much too high. The recent *Editio Minor* has a much more satisfactory text, which again has been greatly improved in the last four or five years by the thorough and scientific investigations of West and Meritt.<sup>4</sup> Thanks to them, it is now possible to work out, within a comparatively small margin of error, the amount of the actual tribute for many years. But when we do this, we are at once struck by the extraordinary fact that in no year before the war does the actual tribute attain to the Aristidean norm of 460 T. In the first assessment period, 454/3-451/0, the difference is not great; but, thereafter, the total falls rapidly. Dr. Meritt has kindly informed me of some of his results, which agree closely with my own calculations. In 444/3 the amount collected was only 376 T and some drachmae. Between 443 and 439, it averages within a few talents of 395. In the re-assess-

<sup>1</sup> cf. Kolbe: *Das Kalliasdekret* (Sitz. Preuss. Akad., 1927, XXVIII).

<sup>2</sup> Plut. Arist., 24.

<sup>3</sup> Diod., XII, 41.

<sup>4</sup> *Harvard Studies in Class. Philol.* XXXVII. 55-98; XXXVIII. 21-73; *Amer. Jour. Philol.*, XLVII, 171-6; *Trans. Amer. Philol. Assoc.*, LVI, 252-267; *Amer. Jour. Arch.*, XXX, 137-149; XXXI, 180-185, etc.

ment of 438 some increase was made, but there is no sign of any general or large increase in the next period, 434/3-431/0. The lists for 433/2 and 432/1 have, in large measure, been reconstituted,<sup>1</sup> and we can form a fairly accurate estimate of the income from the tribute during these years. The gaps are too large to ensure absolute accuracy; and it is possible that a more detailed and careful analysis than I have either skill or patience for may reach results a little different. But the margin of error is comparatively small. The tribute received in 433/2 was about 386 T; in 432/1 only about 348 T. These figures are far removed from Thucydides' 600 T.

Various explanations of this discrepancy have been suggested. Cavaignac asserts that the tribute was raised in the re-assessment of 439 and again in 435 and 431 and regards Thucydides' figure as 'a theoretic total.'<sup>2</sup> But, apart from the fact that the assessment was revised in 438 and 434 (not in 439 and 435),<sup>3</sup> the lists as revised by West and Meritt show little trace of any general increase; and it is unlikely that even the theoretic total could have amounted to anything like 600 T. In fact, Cavaignac's estimates of the income from the tribute are always too high. Mr. Tod, while admitting that the quota lists show that the words of Thucydides cannot be taken literally, suggests that 'they may correctly summarise the external revenue of the state.'<sup>4</sup> There were other sources of income like the obscure dekate or tenth alluded to in I. G<sup>2</sup>. I, 91. Busolt long ago put forward the suggestion that the instalments of the Samian indemnity were included in the 600 T; but this is not probable as the indemnity was not a regular and permanent source of income. None of these explanations meets the real difficulty, which is that while Thucydides says that the allies paid 600 T of tribute annually we know that the actual receipts from the tribute did not amount to two-thirds of that sum.

Dr Meritt indicates two possibilities.<sup>5</sup> We may have here an instance of haplography: ἐξακοσίων for ἐξ [ἡκοντα καὶ τετρα] ακοσίων. But this mistake, if it occurred, must have occurred before the time of Plutarch, who quotes Thucydides' 600 T. The other possibility is that when our authorities mention the amount of the tribute they include both ships and cash payments. On this view, the 460 T of the original Aristidean assessment and the 600 T of Thucydides represent the expenses of the ships contributed by the non-tributary allies as well

<sup>1</sup> I.G<sup>2</sup>. I, 212, 213. *Harvard Stud. Class. Philol.*, XXXVIII, plates 11 and 12.

<sup>2</sup> Cavaignac, *Hist. Fin.*, 111.

<sup>3</sup> Meritt in *Amer. Jour. Arch.*, XXIX, 292-8; West and Meritt, *ib.*, 434-439.

<sup>4</sup> *Camb. Anc. Hist.*, V, 28-9.

<sup>5</sup> In a letter.

as the money contributions of the tributary allies. This would solve the serious difficulty that thirty years after the original assessment, when many new cities had been enrolled in the empire and many autonomous allies had been reduced to the status of tributary subjects, the actual tribute received was considerably less than 460 T. But in 431 only Chios and the cities of Lesbos supplied ships; the money assessment had not been greatly increased; and it is difficult to see how the total could have reached 600 T. Even wealthy states like Thasos and Aegina only paid 30 T; and it is improbable that Chios and Lesbos between them contributed ships equal to 200 T. The language of our literary authorities, again, indicates that the assessment was a cash assessment. We can scarcely assume that the 600 T included ships as well.

Another explanation is possible, which, as far as I am aware, has not yet been suggested. The *quota* list contains the names of such cities only as paid tribute in any particular year; but a city might be a defaulter or be excused for one reason or another; and the lists therefore are not identical even within one assessment period. But the assessment list had a wider scope. It is true that no *assessment* lists previous to 425 have come down to us. But they included the names of all cities which regularly paid tribute; and it is probable that they contained the names of all states which had ever belonged to the empire, even though they had long ceased to pay tribute, and perhaps the names of some which had never belonged to the empire at all. Athenian policy in this respect was like that of the Great King,<sup>1</sup> it was most reluctant to recognise defections. The Lycian and many of the Carian towns had long since seceded,<sup>2</sup> but in the early years of the Peloponnesian War Athens sent expeditions to collect tribute from them.<sup>3</sup> Cleon's assessment list of 425 was, to judge from the surviving fragments, a document which included the names of tributaries old, present and prospective.<sup>4</sup> The earlier lists probably shared the same character, if in smaller measure. It follows that the assessment total must have been considerably larger than the actual total. It is possible that Pericles had the former in mind and it may have reached 600 T. But my calculations on this basis do not yield a total of more than 500 T.

To summarise: none of the suggested explanations of these two statements of Thucydides is really satisfactory. The chance of an interpolation or corruption of the text is slight. The alternative possibility is that Thucydides made a mistake.

<sup>1</sup> Thuc. VIII. 5.

<sup>2</sup> The Lycian towns appear only in the list of 446-5, I.G.<sup>2</sup>, I, 199. After 440, many of the Carian towns fell away and in 438 that district was amalgamated with Ionia.

<sup>3</sup> Thuc. II. 69, III. 19.

<sup>4</sup> I.G.<sup>2</sup>, I, 63.

Historians of repute have been obliged to accept that alternative; and I shall proceed on the same assumption.

If Thucydides made a mistake, can we explain how he came to make it? I suggest that it is the result of a misreading of the inscriptions I. G<sup>2</sup>, I, 91, 92, which were inscribed on the two sides of the same stone. One of these is the decree of Callias, already referred to.

In these decrees, for which (as has been said) the generally accepted date is 434, there are two statements which are relevant to our purpose. The completion of a payment of 3,000 T to Athena is mentioned and 200 T are set apart for repayment of the debts to the other gods. It is also decreed that 10 T a year should be spent on the buildings of the Acropolis till the work is finished.

The inscriptions which contain the building accounts of the Propylæa clearly state that the Hellenotamiai contributed a mina per talent, that is, a sixtieth of the annual tribute; the actual figures have unfortunately perished.<sup>1</sup> The same rule probably applied to the Parthenon; and we know that in 444/3 the Hellenotamiai contributed to its expenses a sum amounting in all probability to 37,675 dr. 5 ob.<sup>2</sup> The tribute for the year must, therefore, have been just over 376 T, which agrees with the result of calculations based on the quota list. This, then, was the regular practice. In I. G<sup>2</sup>, I, 92, a definite sum of 10 T was set apart for the buildings. Instead of the exact sixtieth, a round sum is assigned. It was very natural for Thucydides to assume that the 10 T represented a sixtieth of the average tribute. The deduction that the tribute averaged 600 T was wrong, at any rate of the actual receipts, but it is intelligible.

Again, at the outbreak of the war, we are told that in the Acropolis there were 6,000 T of coined silver in the reserve and 500 T of bullion. But, shortly before, 3,000 T had been paid to Athena by the state and 200 T to the other gods. If we add all these amounts, together we reach the precise total of 9,700 T, which is said to have been the maximum amount of the reserve. It is generally held that Athena and the other gods were the bankers of the state and that the state had no reserve apart from the treasure of Athena herself. But Thucydides, estimating the maximum resources of the state, added the 3,200 T to the 6,500. If we knew more about the Athenian system of finance this might prove more intelligible than it now appears.

Thus we have a complete and natural explanation of the two mistakes (if they are mistakes) of Thucydides. We should not forget that Thucydides did not pay much attention to problems of finance. He does not mention two of the most

<sup>1</sup> I. G<sup>2</sup>, I, 364, 365, 366.

<sup>2</sup> I. G<sup>2</sup>, I, 342. The first four figures have not been preserved and have been wrongly restored in the ed. min.

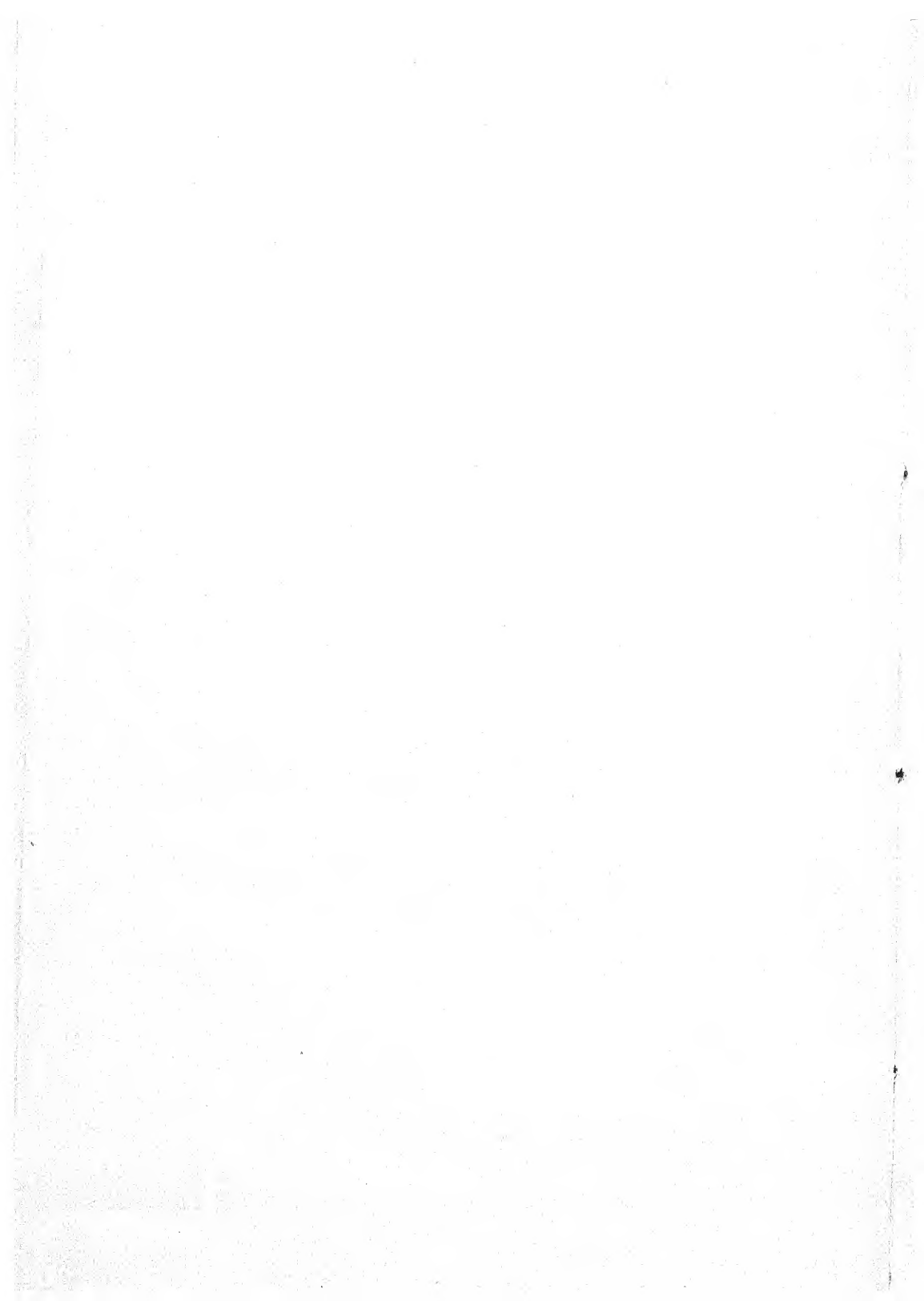
significant events in Athenian financial history, the decree of Callias and Cleon's 'doubling' of the tribute in 425. He does not tell us how much money was brought from Delos at the time of the transfer of the federal treasury. Rarely does he mention any figures at all; and they are generally round figures.<sup>1</sup> Let us remember also that for twenty years after 424 he was an exile from Athens. His mistakes will not then seem altogether incompatible with that scrupulous conscientiousness which is his avowed principle and general characteristic.

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<sup>1</sup> Thuc. II. 70, 97, III. 19.

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## Geophilid Centipedes from the bed of the Cooum River (Madras).

By BONAVis BONNELL.

### Introduction.

Generally Geophilids are obtained from under stones and in loose soil. One form in particular was obtained in good numbers from soft moist soil along with Polychaet worms of the genera *Lycastis* and *Marphysa*. This is a peculiar habitat for a centipede. In 1887, Dr. Latzel of Vienna identified a marine specimen discovered by Mr. J. Sinel in Jersey to be *Geophilus submaritima*. (*Nature*, Dec. 1889, p. 104.) Lydekker mentions that *Linotenia maritima* and *Schendyla submarina* have been obtained from the shores of Western Europe beneath stones at low water mark. (*Royal Natural History*, 1896, Vol. 6, p. 208.) Recently, *Pectiniunguis americanus* has also been recorded to have a strictly littoral habitat, occurring under sea-weed, drift-wood, etc., on the coasts of the gulf of Mexico including Florida, and on the coasts of lower California (R. V. Chamberlin in *Annals of Entomological Society of America*, Vol. 8, No. 3, 1920.). The present paper describes the forms and discusses the habits and peculiarities of those obtained in the mouth of the river Cooum in Madras where the water is brackish.

The river Cooum is shallow at its mouth and for the greater part of the year the bar is closed preventing the emptying of the river into the sea. Numerous small patches of land jut out of the water here and there in the course of the bed of the river being covered only during flood and during high tide when the bar is open.

### Localities.<sup>1</sup>

(1) About the end of July 1928, a few specimens were collected from a piece of land in the bed of the Cooum surrounded by water not less than  $2\frac{1}{2}$  feet deep on all sides and from ten to twelve feet wide. This bit of land which is situated in the Southern arm of the Cooum between the Gymkhana and the Government House is frequented by fishermen, who collect Polychaet worms of the Genera *Marphysa* and *Lycastis*. The forms were obtained when search was made for *Lycastis* and the extremely fine specimens lay coiled within moist loose soft mud just as these Polychaets do. Although these forms differed

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<sup>1</sup> See map appended.

from the fleshy red colour of *Lycastis* and were of a pale brownish yellow colour, they were taken to be young forms of *Lycastis* with the colour yet to be developed. One fact, however, which was noted at the time was the quickness with which they took cover. The lens and the microscope in the laboratory revealed them to be Centipedes belonging to the Geophilomorphs.

(2) On subsequent occasions they were obtained from heaps of soil peeping out of water from the bed of the Cooum at a point east of the Islandground and towards the Napier bridge. The heaps themselves were piled by fishermen digging for *Marphysa*. That, nearest to the shore was about three feet away and the others were separated by intervals of two or three feet more. In the superficial layers of these heaps Centipedes were found coiled comfortably showing practically no attempt to escape or leave the place and along with these certain Forficulids which were seen to run on the water and cross from one mound to another were obtained.

(3) It had recently been decided by the Madras Corporation to flood the Cooum periodically with water pumped in from the sea. The operation began for the first time in the end of July and since then the mounds and the piece of land in the bed of the Cooum have been submerged becoming visible only occasionally for a few hours at a time. When the mounds are thus exposed to view no trace of these Centipedes can be found. On the assumption that they had migrated to the shore, excavations were made on the shore between the minimum and maximum water levels. At first this appeared an unsuccessful attempt, but later it was discovered that they lived in the very loose sand of crab burrows along with Amphipods and Isopods. The burrows were a few days old. It is probable that these Geophilids move about during nights in search of food and occupy heaps at the mouth of crab burrows expecting to find food from the remnants of the crab's morsel and also shelter. Pocock mentions that *Limotenia maritima* was found in company with hosts of scuttling woodlice and hopping sand shrimps (*Zoologist*, 1900, ser. 4. 4. p. 484) similar to what was observed in the present case.

#### *Problems.*

The questions to be solved are whether the Geophilids were obtained from the first and second locality by mere accident or whether they represent their natural habitat. If the latter whether there are any peculiarities in structure which enable them to cross water and to withstand submergence for short periods. The theory of accidental occurrence does not seem to be tenable for we should have to account for their occurrence in good numbers in these places and why out of several specimens

found on land this particular form should be unfortunate enough to be stranded is the problem under investigation.

Lydekker mentions that Geophilids subsist almost wholly on earthworms. No earthworms were available in the first and second locality but Polychaets were obtained and it is highly probable that these centipedes have acquired a taste for Polychaet worms and get to these places in search of them.

It has also been stated by Lydekker that forms typically terrestrial can withstand immersion in sea water for many hours in fresh water from one to two weeks. This statement was verified by experiments and how this exactly occurs is what this paper intends to set forth.

#### *Experiments.<sup>1</sup>*

A thin glass beaker was filled completely with fresh water and inverted into a dish containing water. Care was taken to see that there was no bubble at the top. A specimen was then slowly inserted under the beaker. As it was being submerged it collected a bubble of air by curving its posterior extremity and held it on its dorsal surface as it rose to the top of the beaker. The stigmata of the segments are dorso-lateral in position, and possibly the last few stigmata get their supply of air from this store. The bubble of air did not burst but very slowly decreased in size. In all its several movements in the water, in an alternate extension and coiling of the body, the posterior loop was kept in tact. The centipede at first hangs with its head downwards and remains in this position for over an hour after which it descends to the bottom slowly and creeps about even after a period of nineteen hours. Specimens apparently dead recoup almost at once on being taken out and move about as though never submitted to such a serious test. The animal when it dies, dies in a fully expanded condition. We may therefore safely presume that if the animal keeps coiled it is not yet dead.

The form is being described under a New Genus *Mixophilus* by Dr. F. Silvestri and has been called *M. indicus*

#### *Conclusions.*

It may be noticed that no new structure adapting the animal for life under water has been observed and under the circumstances the only alternate conclusions to be drawn are.

1. That the quantity of air needed to maintain life in this form is exceedingly small.
2. That the Tracheae store sufficient air for a period of nearly 24 hours.

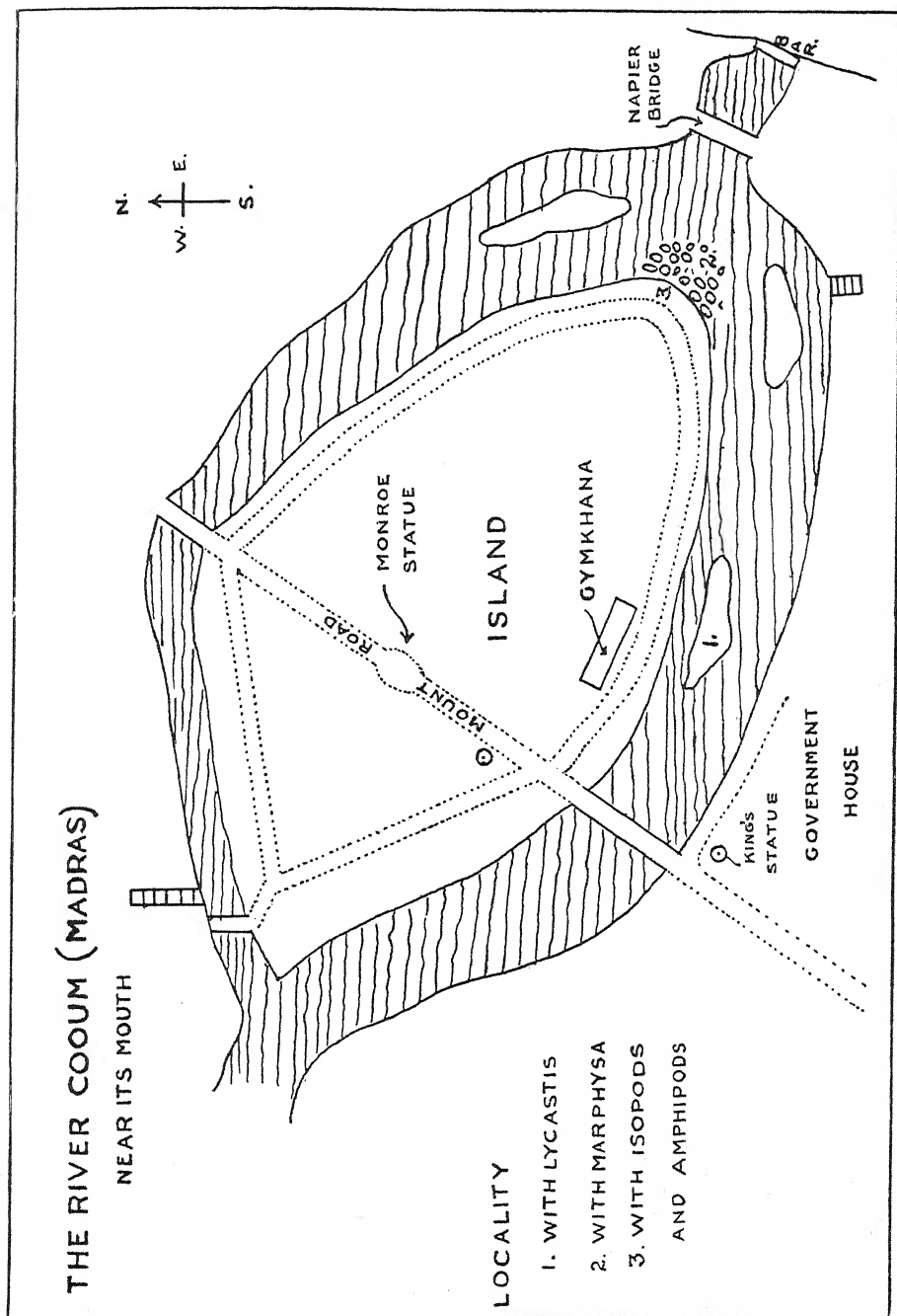
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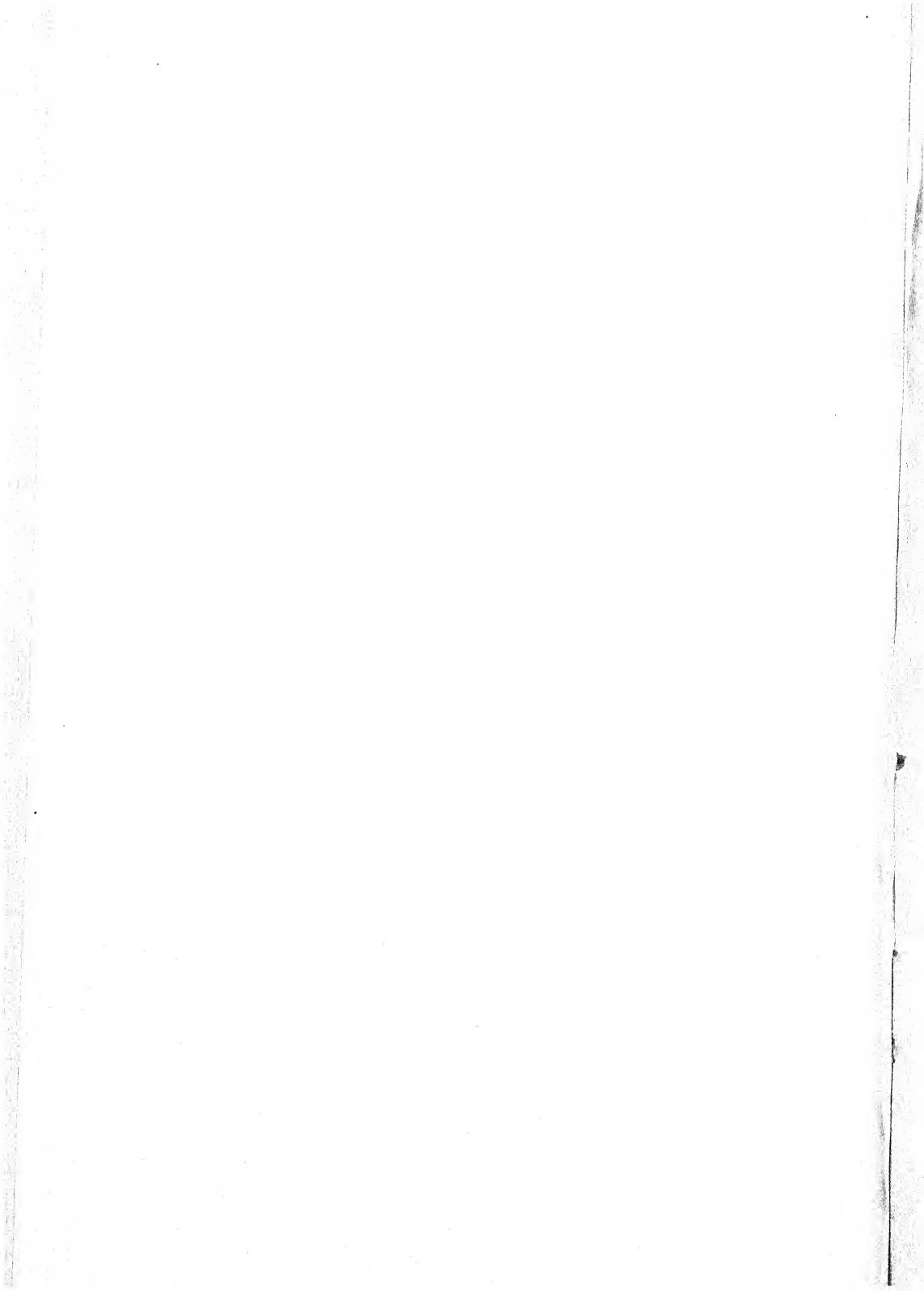
<sup>1</sup> The work was done in the Laboratory of the Presidency College, Madras, by the kind permission of Dr. S. G. M. Ramanupam, Professor of Zoology, from whom valuable suggestions were received.

3. That the loop at the posterior end entangles a sufficient quantity of air on its outer dorsal surface while the chitinous channels in the coxae of the last legs may also serve to store up air.

*Suggestions.*

The polychaet *Lycastis* is regarded as an aquatic form tending towards life on land through the reduction of the parapodia and the simpler nature of the dorsal cirri which act as gills. May it not be that this Geophilid is in the process of changing its habitat in the reverse direction and the two animals meet as it were midway between land and water? It is true that no certain indications of any modification adapting this centipede for an aquatic life have been detected but it is a matter for further investigation, which is being done.





## The Chauhāns.

By R. R. HALDER, Rajputana Museum, Ajmer.

The Chauhāns, like the Parmāras, Chaulukyās, Guhilas, etc., seem to have derived their family name from the name of their primeval man viz., Chāhamāna. At the present day, they claim their descent from the fire-fountain of Vasiṣṭha on Mount Ābū, just as the Parmāras do, and so call themselves *Agnivamśi*. Their old records, however, speak them to be *Sūryavamśi*, i.e., belonging to the solar race. The latter view is supported by the following versions:—

- (1) The *Prithvirājavijayamahākāvya* says that Chāhamāna descended from the *Sūryamaṇḍala* (solar orb).<sup>1</sup>
- (2) The *Hammīramahākāvya* of Nayachandrasūri corroborates the above statement by saying that a celestial man named Chāhamāna came down from *Sūryamaṇḍala*, and having obtained paramount power, ruled over other kings.<sup>2</sup>
- (3) The inscription<sup>3</sup> preserved in the Rajputana Museum, Ajmer, also speaks of Chāhamāna as having born in the solar family.

- १ अथांशुभिस्सूर्यमयस्य चतुषसु सूर्यकान्तादिव सूर्यमण्डलात् ।  
जवाद्बारीहृदखण्डचण्डिमा वसुन्धरासंसुखमर्चिषां चयः ॥ [१]  
इति प्रतापायतनेन तेजसा नभश्चराणां निचयेन चर्चितः ।  
जगत्तथौपुण्यसमृद्धिसंगमः पतङ्गमध्यात्पुरुषो विनिर्यथौ ॥ [१४]  
करेण चापस्य हरेर्मनीषया बलेन मानस्य नयस्य मन्त्रिभिः ।  
धृतस्य नामाग्रिमवर्णनिर्मितां स चाहमानोयमिति प्रथां यथौ ॥ [४४]

Canto II.

- २ ततः शुभं स्थानमिदं विभाव्य प्रारब्धयज्ञो यमपास्तदैव्यः ।  
विशङ्क्य भीतिं दनुजव्रजेभ्यः स्मेरस्य सस्मार सद्दसरग्नेः ॥ [१५]  
अवातरन्मण्डलतोऽथभासां पत्युः पुमानुद्यतमण्डलाग्रः ।  
तं चाभिषिञ्चाच्चदसीयरक्षाविधौ व्यधादेष मखं सुखेन ॥ [१६]  
पपात यत्पुष्करमत्रपाणेः स्थातं ततः पुष्करतीर्थमेतत् ।  
यद्यायमागाद्य चाहमानः पुमानतोऽप्ल्यायि स चाहमानः ॥ [१७]

Canto I.

- ३ समुत्थितोऽर्कादनरण्ययोनिरुत्पन्नपुन्नागकदंबशाखः ।  
आश्चर्यमंतः प्रसरत्कुशोऽयं वंशोर्थिनां त्रीफलतां प्रयाति ॥ [३५]



The above three versions speak of the Chauhāns as belonging to the solar race. A somewhat different statement, however, is made by Col. Tod, who at one place<sup>1</sup> connects them with the fire-pit of Vāśishṭha on Mount Ābū, but at another place<sup>2</sup> says that the *gōtrāchārya* of the Chauhāns is "Somvansa, Vacha gotra" etc., i.e., they belong to the lunar race and are connected with Vatsa *Rishi*. This latter version of Tod is supported by the following inscriptions:—

- (a) The inscription<sup>3</sup> dated, Samvat 1224 (A.D. 1167), of the time of Prithvirāja II, speaks of him as having born in the race of the descendants of the moon.
- (b) The Bijōlyān inscription,<sup>4</sup> dated S. 1226 (A.D. 1170), of the time of Sōmēśvara represents Sāmanta, an early Chauhāna chief, to have been born in the Vatsa *gōtra*.
- (c) The inscription<sup>5</sup> dated S. 1319 (A.D. 1263) of the time of Chāchigadēva connects Chāhamāna with Vatsa *Rishi*.
- (d) The Mount Ābū inscription<sup>6</sup> of S. 1377 (A.D. 1320) says that the Chāhamāna race was created by the sage Vatsa.

From the above, we conclude, whether the Chauhāns belong to the solar or lunar race, or have any connection with Vatsa *Rishi*, they assuredly do not belong to the *Agnikula* or have any connection with Vāśishṭha *Rishi*, as they declare themselves to be. They have, in all probability, derived this view about themselves from the poem called *Prithvirājārasā*,<sup>7</sup> which is a "later forgery."

Now let us briefly describe the accounts of the rulers of the main line of the Chauhān family, which began its rule in Mārwar. At first, Śākambhari (Sāmbhar in Mārwar) was their capital, then Ajmer and then Ranthambhōr in the Jaipur

आधिव्याधिकृतदुर्गतिपरित्यक्तप्रजास्तत्र वे ।

सप्तद्वीपभुजो नृपाः समभवन्निष्ठाकुरामादयः ।

.. .. .

तस्मिन्नथारिविजयेन विराजमानो राजानुरजितजनोज्जि चहमानः ।

.. .. .

<sup>1</sup> Tod's *Rājasthān*, Vol. I, p. 113.

<sup>2</sup> *Ibid.*, Vol. III, p. 1444.

<sup>3</sup> *The Chronicles of the Pathan kings of Delhi* by Edward Thomas, pp. 60-61.

<sup>4</sup> *J.A.S.B.*, Vol. LV, pt. I, p. 41, verse 12.

<sup>5</sup> *Ep. Ind.*, Vol. IX, p. 71.

<sup>6</sup> *Ibid.*, Vol. IX, p. 79.

<sup>7</sup> See my article in *J.B.B.R.A.S.*, Vol. III (New Series), p. 203.

territory became their capitals; so that the Chauhāns can distinctly be called after the names of these capitals, as the Chauhāns of Sāmbhar, Ajmer and Ranthambhor, though they belonged to the same line.

#### A. THE CHAUHĀNS OF SĀMBHAR.

1. **Chāhamāna.** He was the originator of the Chauhān family, and is said to have descended from *Sūryamandala*. He was very powerful and possessed immense wealth. He became the ruler of a very large part of the country. His younger brother Dhanañjaya, who was very clever in the art of war, was the Commander of his forces.<sup>1</sup> He died at Pushkar while on pilgrimage.

2. **Vāsudēva.** He was born in the family of Chāhamāna.<sup>2</sup> He was very brave, powerful, famous, extremely benevolent and popular. A mythical story about him is related in Canto IV of *Prithvirājaviṣaya*, regarding the foundation of the salt lake at Śākambhari (Sāmbhar), which was so called after the goddess Śākambhari (Pārvatī), whose shrine was there. The descendants of Vāsudēva ruled over the land presided over by the deity Śākambhari and were thus called "Śākambhariśvara."<sup>3</sup>

3. **Sāmantarāja.** He was like a moon in the family of Vāsudēva.<sup>4</sup> He ruled at Ahichhatrapura<sup>5</sup> which is most likely the place now called Nāgaur in Jodhpur territory.

4. **Jayarāja.** He was the son<sup>6</sup> of Sāmantarāja and was very valiant. Also called Ajayarāja and Ajayapāla. The power of other kings dwindled before him.

- 1 अतौव यो दुर्बल एव सर्वथा तमप्यधिष्ठाय बलिष्ठतां नयन-  
समाप्तशस्त्राविधौ धनंजयो बभूव सेनापतिरस्य शाश्वतः ॥ [१४]

*Prithvirājaviṣaya*, Canto II.

- 2 कैलासोत्सङ्गसङ्गीतकसभिकशिवादिष्टगन्धर्वरामा-  
गातयोद्दामकर्मा समजनि वसुधावासवो वासुदेवः ॥ [८२]

*Ibid.*, Canto II.

- 3 भुवं शाकम्भरीदेव्या सनाथां यदुपासते ।  
तद्गङ्गाक्षेन भण्यन्ते सर्वे शाकम्भरीश्वराः ॥ [५]

*Ibid.*, Canto II.

- 4 जज्ञे तदन्वयोदन्वत्सुधांशुर्वसुधापतिः ।  
सामन्तराजस्सामन्तराजिकैरविणीरविः ॥ [७]

*Ibid.*, Canto V.

- 5 See note 4 on page 2.

- 6 सुषुवे जयराजं तं राजन्तं तं जयत्रिधा ।  
यं वोच्याजौ विव[स्वन्तं वस्वन्तं प्रा]प राजकम् ॥ [८]

*Prithvirājaviṣaya*, Canto V.

5. **Vigraharāja (I).** He was the son<sup>1</sup> of Jayarāja. His fame spread far and wide.

6. **Chandrarāja (I).** He was the son of Vigraharāja.<sup>2</sup>

7. **Gōpēndrarāja.** He was the younger brother of Chandrarāja.<sup>3</sup>

8. **Durlabharāja (I).** Was the son of Chandrarāja.<sup>4</sup> He fought with the Gaudas.<sup>5</sup>

9. **Gōvīndarāja (I).** He was the son<sup>6</sup> of Durlabharāja (I). Also called Gūvaka. He attained superiority as a hero in the court of Nāgāvalōka (Nāgabhaṭa II) of Kanauj.<sup>7</sup> Now Nāgabhaṭa II flourished between the periods Samvats 872 and 890 (A.D. 815 and 833).<sup>8</sup> The date of Govindarāja, therefore, would fall about this period, i.e., S. 872 (A.D. 815).

10. **Chandrarāja (II).** He was the son of Gōvīndarāja.<sup>9</sup> Also called Śaśinripa.

11. **Gōvāka.** He was the son<sup>10</sup> of Chandrarāja II and was very famous. He was dexterous in the art of war and peace, and brave and firm in battle. His sister, Kalāvati, possessed enchanting beauty; so her hand was sought by twelve kings, among whom she was married to the king of Kanauj (probably

1 इति स्तुतं कविवरैर्मुखं सर्वमहस्विनाम् ।

प्राप विग्रहराजं स ग्रहराजमिवात्मजम् ॥ [११]

*Ibid.*, Canto V.

2 तनयश्चन्द्रराजोऽस्य चन्द्रराज इवाभवत् ।

संग्रहं यस्सुदत्तानां सुदत्तानामिव व्यधात् ॥ [१५]

*Ibid.*, Canto V.

3 तस्य गोपेन्द्रराजोऽभूदनुजो यो मनोविषाम् ।

गोपेन्द्रराजसृतिरुद्रोमण्डल [धृतेरभूत्] ॥ [१७]

*Ibid.*, Canto V.

4 ततो दुर्लभराजेन चन्द्रराजस्य स्तनुना ।

विनोदकेन गमिता वृद्धिं कीर्त्तयिता भुवि ॥ [१८]

*Ibid.*, Canto V.

5 अग्निः स्नातोत्यतो यस्य गङ्गासागरसङ्गमे ।

चिरं गौडरसास्त्रादशुद्धो ब्राह्मणतां यधौ ॥ [२०]

*Ibid.*, Canto V.

6 प्रजापतिपदब्रह्मा षाड्गुण्यपुरुषोत्तमः ।

सुतो गोविन्दराजोऽस्य शक्तित्रयमहेश्वरः ॥ [२१]

*Ibid.*, Canto V.

7 *Ind. Ant.*, Vol. 57, p. 184.

8 *Ep. Ind.*, Vol. IX, p. 199, *Prabhāvakacharita*, p. 177.

9 नयन्मन्त्रयमुक्तासमात्मभूतशिवस्य च ।

द्वितीयश्चन्द्रराजोऽभूत्ततोऽरिध्वान्तचन्द्रमाः ॥ [२२]

*Prithvirājaviṇaya*, Canto V.

10 सर्वराजाकंजीमूतस्सर्वदिग्भङ्गरीमधुः ।

गोवाकस्तनुस्सर्वद्वौपमण्डलधामिकः ॥ [२३]

*Ibid.*, Canto V.

Bhōja I, S. 900-38), and the wealth received after defeating other kings was given in her dowry.<sup>1</sup>

12. Chandanarāja. He was the son<sup>2</sup> of Gōvāka. He was very popular and wealthy. He killed the Tomara King Rudrēna (probably Rudrapāla of Delhi) in battle.<sup>3</sup> His wife Rudrānī also called Yoginī and Ātmaprabhā set up on the bank of Pushkar one thousand *lingās* of Śiva, which were, as it were, one thousand lamps to remove the darkness of the place.<sup>4</sup>

13. Vākpatirāja (I). He was the son<sup>5</sup> of Chandanarāja. Also called Vappayarāja Vatsarāja and Vaprarāja. He won 188 victories through his own prowess and built a very high temple of Śiva at Pushkar.<sup>6</sup> He was attacked by Tantrapāla (a neighbouring chief), who was forced to retreat.<sup>7</sup> He had three sons, named Śimharāja, Lakshmaṇa and Vatsarāja, of whom Śimharāja succeeded his father; Lakshmaṇa founded the kingdom of Nāḍōl, and Vatsarāja received a separate territory for himself.

14. Śimharāja. He was the son<sup>8</sup> of Vākpatirāja I. He was a very brave, charitable and illustrious ruler. He subdued a Tomar leader allied with a certain king Lavaṇa and kept many prisoners in his prison.<sup>9</sup> He also defeated a Muhammadan general named Hātim.<sup>10</sup> He built a beautiful temple of Śiva at Pushkar. He was subordinate to the Imperial Pratihāras (Devapāla or Vijayapāla) of Kanauj, and had three sons named Vighararāja, Dūrlabharāja, and Gōvindarāja.<sup>11</sup>

15. Vighararāja (II). He was the son<sup>12</sup> of Śimharāja and was a very valiant ruler. He restored the fortune of his

<sup>1</sup> *Ibid.*, Canto V, verses 31-32.

<sup>2</sup> नन्दनश्चन्दनस्तस्य यस्य नामन्युदीरिते ।  
जनस्सफल इत्युक्तिशेषादुच्चधर्मं जहौ ॥ [३३]

*Ibid.*, Canto V.

<sup>3</sup> *Ep. Ind.*, Vol. II, p. 121, verse 14.

<sup>4</sup> *Prithvirājaviṇaya*, Canto V, verse 37.

<sup>5</sup> स्तनुर्वाक्पतिराजोऽस्य प्रसाद इव सूक्तिमान् ।  
क्षिताय सर्वलोकानामुदपद्यत शान्भवः ॥ [४०]

*Ibid.*, Canto V.

<sup>6</sup> *Prithvirājaviṇaya*, Canto V, verse 43.

<sup>7</sup> *Ep. Ind.*, Vol. II, p. 121, v. 16.

<sup>8</sup> धर्मस्थेव नवः [सर्गः] स्थिति-—-—  
सिंहराजः[स्तुतस्स]स्य संहार इव शान्भवः ॥ [४४]

*Prithvirājaviṇaya*, Canto V.

<sup>9</sup> *Ep. Ind.*, Vol. II, p. 127, v. 19.

<sup>10</sup> *Hamīra Mahākāvya*, p. 14.

<sup>11</sup> *Ibid.*, Vol. II, p. 118. Also *Ind. Ant.*, Vol. 57, p. 184.

<sup>12</sup> स्तनुर्विग्रहराजोऽस्य सापराधानपि द्विषः ।  
दुर्बला इत्यनुध्यायन्नचत्रिय इवाभवत् ॥ [४७]

*Prithvi.*, Canto V.

family and extended his sway as far as Narmadā.<sup>1</sup> He attacked the Chaulukya king Mūlarāja I (S 1017-52) of Gujārāt and forced him to retire to the fortress of Kanthā (Kanth Kōt) in Cutch.<sup>2</sup> He received the name *khurarajō ghōrāndhakārā*, i.e., producer of darkness by the dust of the heels of his horses. He was kind even towards his enemies. He built a temple of the goddess Āsāpurī at Bhrigukachchha (Broach).<sup>3</sup> His inscription is dated S. 1030 (A.D. 973); consequently the date of Chāhamāna, the 14th predecessor of him, would fall in the last quarter of the 7th century A.D., taking an average of 20 years for each ruler.

16. Durlabharāja (II). He was the younger brother<sup>4</sup> of Vighararāja II. The name of his minister was Mādhava. He was different from his namesake who harassed Mahendra, the Chauhān ruler of Nādōl.<sup>5</sup> He was called *Durlāṅghyameru*.

17. Gōvindarāja (II). He was the youngest brother<sup>6</sup> of Vighararāja II. Also called Gaṇḍu and Gaṅgadeva. He succeeded Durlabharāja and his fame was sung by many a poet. He is said to have defeated Sultān Maḥmūd.<sup>7</sup>

18. Vākpatirāja (II). He was the son and successor<sup>8</sup> of Gōvindarāja II. Also called Vallabharāja. He was a great warrior and killed the Guhila ruler Ambāprasāda of Āghāṭa (Āhāḍa, the old capital of Mēwār).<sup>9</sup> He made his reign ex-

1 सूर्यवंशप्रसूतस्य चन्द्रमण्डलनिर्गता ।

तस्य रेवामयौ वाक्त्रैः कीर्त्तिर्मल्लिनिताभवत् ॥ [५२]

*Ibid.*, Canto V.

2 *Bombay Gazetteer*, Vol. I, pt. I., p. 158.

3 यथादाशापुरौदेया भृगुकच्छे स धाम तत् ।

यद्रेवासृष्टसीपानं चन्द्रयुम्बति सूर्यनि ॥ [५३]

*Prithvi*?, Canto V.

4 तस्य दुर्लभराजोभूदनुजो साधवानुगः ।

नारौणां सततं येन हृदये मदनायितम् ॥ [५४]

*Prithvi*?, Canto V.

5 *Ep. Ind.*, Vol. XI, p. 68.

6 यशंसि शीतलीकर्तुमिच्छयेव दिग्गजनाः ।

यस्य गोविन्दराजाख्यस्य तस्मादुदपद्यत ॥ [५६]

*Prithvi*?, Canto V.

7 *Gaudavaho*, Introduction, p. cxxxvii. If the Sultān be Maḥmūd Ghaznī, then the event probably took place in A.D. 1025 on the Sultān's way to Somanātha (*Duff*., p. 113).

8 तस्माद्वाक्पतिराजेन सम्भूतमवनीभुजा ।

कलिः कृतौकृतो येन भू [मिच्छ त्रिदि]वौकता ॥ [५८]

*Ibid.*, Canto V.

9 शम्बाप्रसादमाघाटपतिं यस्मैनयान्वितम् ।

यस्यजगदशसः पञ्चात्पार्थ्यं दक्षिणदिक्पतेः ॥ [५९]

tremely happy for the people. He was called *gōtrabhīda* (Indra) by his enemies; *dahana* (fire) by the women of his enemies; *mṛityu* (death) by the warriors of his enemies; *rākshasēśvara* (lord of the demons) by the people of his enemy's country; *prakṛishlachētā* (noble-minded) by the politicians, *sadāgati* (wind) by those who sought protection with him and *dhanada* (*Kubera*) by the needy.<sup>1</sup> His memory was long cherished by the people after his death.

19. **Vīryarāma.** He was the son<sup>2</sup> of Vākpatirāja II. Also called Vijayarāja. He was skilful in fighting, but was accidentally killed by the king Bhoja I, (S. 1076-99) of Avanti Mālwa).<sup>3</sup>

20. **Chāmuṇḍarāja.** He was the younger brother of Vīryarāma. He is said to have ascended the throne according to *Hammīra Mahākāvya* and the Bijolyān Inscription but not according to *Prīthvirājaviṇaya*. He built a temple of Vishnu at Narapura (Narwar), in memory of his brother Vīryarāma.<sup>4</sup>

21. **Durlabharāja (III).** He succeeded Chāmuṇḍarāja.<sup>5</sup> He was also called Dūsala. He was styled *Vīrasimha*, but was unfortunately killed in the fighting with the *Mātangas* (Muhammadans).<sup>6</sup> So, his younger brother Vīgraharāja had to assume the rein of government.<sup>7</sup>

22. **Vīgraharāja (III).** He was the younger brother of

भिन्नमन्वाप्रसादस्य येन च्छुरिकया सुखम् ।

प्रतापजीविकादग्निभस्ममेव व्यसूचत ॥ [६०]

*Ibid.*, Canto V.

Ambāprasāda was the successor of Śaktikumāra, whose inscription is dated S. 1034.

<sup>1</sup> *Prīthvirājaviṇaya*, Canto V, vv. 61-62.

2 वीर्यरामस्तुतस्तस्य वीर्येण स्यात्स्मरोपमः ।

यदि प्रसन्नया दृष्ट्या न दृश्येत पिनाकिना ॥ [६५]

*Ibid.*, Canto V

3 अगम्यो यो नरेन्द्राणां सुधादीधितिस्तुन्दरः ।

जङ्गे यशस्वयो यस्य भोजेनावन्तिभूभुजा ॥ [६७]

*Ibid.*, Canto V.

4 तस्य चामुण्डराजेन कनिष्ठेन विनिर्ममे ।

विष्णोर्नरपुरे धाम विष्णुलोकं तथात्मनः ॥ [६८]

*Ibid.*, Canto V.

5 अभूद्दुर्लभराजोस्माद्यदीयैः प्रतियोगिभिः ।

चराचराणां लुटितं पादान्ते भूभृतां भयात् ॥ [६९]

*Ibid.*, Canto V.

6 मातङ्गसङ्घे यस्मिन्वीरसिंहेस्तमागते ।

अपरागोऽनुतापश्च विधिना प्रापि कर्कशः ॥ [७०]

7 तस्य विग्रहराजेन भोगीन्द्रेणानुजन्मना ।

शेषेण च सदीभारं त्याजिताः पृथिवीभृतः ॥ [७१]

*Ibid.*, Canto V.

Durlabharāja. Also called Visala. He gave to the Mālava king. Udayāditya (S. 1116-1143), a horse named Sāraṅga, with whose help the latter conquered the Gurjara king Karna (S. 1120-50).<sup>1</sup> His wife was Rājadevi.

23 **Prithvirāja (I).** He was the son<sup>2</sup> of Vighraharāja III. At Pushkar, he killed seven hundred Chaulukyās, who came there to rob the Brahmanas.<sup>3</sup> He built an alms-house on the way to Sōmanātha. His wife's name was Rāsalladēvi. His inscription is dated S. 1162.

24. **Ajayarāja.** He was the son<sup>4</sup> of Prithvirāja I. Also called Ajayadēva, Ālhanadeva and Salhana. He was very brave. He killed three kings, one of whom was named Yaśōrāja.<sup>5</sup> He conquered the country up to Ujjain, and subdued the Mālava king (?) Sulhana.<sup>6</sup> He was also very rich. He filled the country with silver coins.<sup>7</sup> His queen Sōmalēkhā (Saumalladēvi) coined money every day.<sup>8</sup> He built many reservoirs of water in the temples of gods and completely subdued the Muhammadans.<sup>9</sup> He founded the town of Ajayameru (Ajmer), which was then superior to Laṅkā and Dvārikā.<sup>10</sup> Having founded this town and seated his son

1 सारङ्गाखं तुरङ्गं स ददौ यस्मै मनोजवम् ।

नक्षत्रैश्च वसं क्षीरसिन्धोरन्यः प्रयच्छति ॥ [७७]

जिगाय गूर्जरं कर्णे तमश्च प्राप्य मालवः ।

लब्धानूहसूर्यरथं करोति योमलङ्घनम् ॥ [७८]

2 पृथ्वीराजस्तु तस्मात्ततो - - - रभूत् ।

कुमारचञ्चारी हि कुमारी मद[नदिषः] ॥ [७९]

*Ibid.*, Canto V.

3 *Prithvirājaviṇaya*, Canto V, verse 81.

4 तस्मादजयराजोऽभूद्दद्यान् यद्दद्यान्तः ।

सर्वरत्नप्रदासिन्धोः कल्पवृक्षस्य जन्म तत् ॥ [८३]

*Ibid.*, Canto V.

5 *J.B.A.S.*, Vol. LV, pt. I, p. 41, verse 15.

6 *Prithvirājaviṇaya*, Canto V, v. 85. Sulhana, according to the Bijolyān Ins. was the commander of the army, see n. 3, above.

7 स दुर्वर्णमयैर्भूमिं रूपकैः पर्यपूरयत् ।

तां सुवर्णमयैस्तत्र कविर्गस्तपूरयत् ॥ [८८]

8 सोमलेखा प्रियाप्यस्य प्रत्यहं रूपकैर्नवैः ।

कृतैरपि न संस्पर्शं कलङ्गेन समासदत् ॥ [९०]

*Ibid.*, Canto V.

9 यस्तदन्तायुधकरान्परिहर्तव्यपङ्क्तिन् ।

अत्यन्तगर्जनान्मत्तान्मातङ्गानजयद्रणे ॥ [११३]

*Ibid.*, Canto V.

10 भवत्यजयमेखलं सार्धं यस्य सुरालयेः ।

न हि पुण्यप्रभावेण तदस्येव न यद्भवेत् ॥ [१२०]

*Ibid.*, Canto V.

(Arṇōrāja) on the throne, he went to Heaven. Henceforth Ajmer became the capital.

#### B. THE CHAUHĀNS OF AJMER.

25. **Arṇōrāja.** He was son of Ajayarāja by his wife Sōmalēkhā.<sup>1</sup> Also called Ānāka, Ānaka and Ānnallādēva. He made Ajmer his capital. The first invasion of the Muhammadans on Ajmer seems to have been made during his reign. He completely vanquished the Muhammadans and killed a large number of them.<sup>2</sup> Those Muhammadans who came to Ajmer through the desert were extremely thirsty, and died after drinking the blood of horses. The dead bodies of the Muhammadans that were piled up on the road were burnt by the villagers for fear of bad smell being spread up all around. In order to purify the place, where the Muhammadans were killed, he constructed a lake, which was filled up with the water of the river Indu (Chandra).<sup>3</sup> He also fought twice with the Solāṅki ruler Kumārāpāla (S. 1199-1230) of Gujarāt.<sup>4</sup> He built a temple of *Vārūna Vāṇalinga* in the name of his father Ajayarāja. He married the princess Sudhavā of *Avichi* (without waves i.e., Mārwar) and with Kāñchanadēvi, the daughter of the king Siddharāja Jayasimha of Gujarāt. He had three sons from Sudhavā, two of whom were named Jagadēva and Vighararāja, and one son named Sōmēśvara from Kāñchanadēvi.<sup>5</sup> His inscription is dated S. 1196.

26. **Jagadēva.** He was the son of Arṇōrāja by his wife Sudhavā of Mārwar. He rendered to his father the same service as Bhṛigunandana (i.e., Paraśurāma) had done to his mother, and went out like a *dīpa* (Indian lamp) leaving behind

1 भाग्यैस्समं समुत्पन्नं प्रजाभिस्तुह लालितम् ।

वर्धितं सुवर्तैस्साकमर्णोराजमस्तुत सा ॥ [२१]

*Ibid.*, Canto V.

2 दोषशालिनामाजयमेरवाणां यल्लोहघातैः करणीयमासीत् ।

भारायमाणैर्निजवर्मलोहैस्तद्वभूवन्बहवस्तुष्टकाः ॥ [४]

*Ibid.*, Canto VI.

3 विशुद्धिहेतोरेव तस्य राजा प्राणैन्द्रियाकस्मिकरौरवस्य ।

अकारयत्कीर्तिपटोपिनदचीरोदनमङ्कुरणं तटाकम् ॥ [२१]

या पुष्करारण्यविहारशैला सन्दाकिनौवेन्दुनदी प्रसिद्धा ।

भगीरथस्मिन्भुजिव खवन्त्या तया तटाकं तमपूरि देवः ॥ [२३]

This lake is now called Ānāsagar and the river as the Bāndi River.

*Ibid.*, Canto VI.

<sup>4</sup> *Ind. Ant.*, Vol. 56, pp. 10-11.

<sup>5</sup> *Prithvirājaviṇaya*, Canto VI, vv. 29-34.



a bad smell.<sup>1</sup> For the reason of his being a parricide, it appears, his name is omitted in *Prithvirājaviṣaya* and in the Bijolyān Inscription.<sup>2</sup>

27. *Vigraharāja* (IV). He was the younger brother of Jagadēva. Also called Visaladēva. He was a very powerful monarch. He conquered the land between the Vindhya and the Himālayas, and by repeatedly driving out the Muham-madans, made Āryāvarta once more the abode of the Āryas.<sup>3</sup> He conquered Delhi, made it the residence of the Chauhāns, and extended his sway as far as Āsikā (Hānsī) in the Punjab.<sup>4</sup> He defeated Vastu Pāla (?), destroyed Nāḍol and set fire to Jāvālipura (Jālōr in Mārwar).<sup>5</sup> He was very learned and a patron of learning. He composed the Sanskrit drama called *Harakēli Nāṭaka* and got this as well as the drama called *Lalita Vighraharāja Nāṭaka*, composed by his court-poet Sōmēśvara, inscribed on slabs, some of which are now preserved in the Rajputana Museum, Ajmer. He built a Sanskrit College at Ajmer, which is now called *Adhāi-din-ka-jhōnprā* and which was converted into a mosque in S. 1256 (A.D. 1200) by Shihābu-d-din Ghurī. He was also very charitable. He gave gold to the Brahmans and weighed against precious metals ten times. At the time of his death, he was pleased to learn the news of two sons being born to his brother (Sōmēśvara).<sup>6</sup> He was called 'Kavibāndhava' (*i.e.*, friend of poets). With his death this name<sup>7</sup> disappeared. His inscriptions are dated S. 1210-1211 and 1220.

28. *Aparagāṅgēya*. He was the son of *Vigraharāja* IV. Also called *Amaragāṅgēya*, *Gaṅgapāla*, *Gāṅgadeva* and *Amara-gaṅgu*. He seems to have died shortly after his father's death.<sup>8</sup>

1 प्रथमसुधवासुतलदानीं परिचर्यां जनकस्य तामकार्षीत् ।

प्रतिपाद्य जलाञ्जलिं घृणयै विद्ध्ये यां भृगुनन्दनो जनन्याः ॥ [१२]

Canto VII.

2 The same is the case with Udayasinha I of Mewār, who being a murderer of his father Kumbhā, is not enlisted by the bards among the rulers of Mewār.

3 *Ind. Ant.*, Vol. 19, p. 216.

4 *Ind. Ant.*, Vol. 19, p. 217. Also Vol. 57, p. 11.

5 *J.A.S.B.*, Vol. LV, pt. I, p. 42, V. 25.

6 अथ भ्रातुरपत्याभ्यां सनाथा जानता भुवम् ।

जग्मे विग्रहराजेन कृतार्थेन शिवान्तिकम् ॥ [५३]

7 कैलासं जग्मुषी यातं पश्चाद्विग्रहभूभुजः ।

कविबान्धव इत्येकं भूमावशरणं पदम् ॥ [५५]

*Prithvirājaviṣaya*, Canto VIII.

8 सुतोयपरगात्रेयो नित्येऽस्य रविस्त्रुना ।

उन्नतिं रविवंशस्य पृथ्वीराजेन पश्यता ॥ [५४]

*Ibid*, Canto VIII.

29. **Prithvībhāṭa.** He was the son of Jagadēva. Also called Prithvirāja (II) and Pēthadadēva. He, too, seems to have died soon after the death of his uncle Vighararāja.<sup>1</sup> He is said to have gained victory over the king of Śākambharī (probably Aparagāṅgeya). Since his death the Royal Dignity left the line of Sudhavā and wished to visit Sōmēśvara. The ministers, therefore, brought Sōmēśvara along with his two sons<sup>2</sup> (Prithvirāja and Harirāja) to the Sapādalaksha country (the country ruled over by the Chauhāns) and Karpūradēvi (Sōmēśvara's wife) entered the city of Ajayameru (Ajmer) with her two sons.<sup>3</sup> His inscriptions are dated S. 1224, 1225, and 1226.

30. **Sōmēśvara.** He was the son of Arṇorāja by his wife Kāñchanadēvi of Gujarāt. While an infant, his grandfather, Siddharāja Jayasimha (S. 1150-99) of Gujarāt, on hearing from the astrologers that he would be an incarnation of Rāma to perform certain duties, took him to his court,<sup>4</sup> and it was Kumārapāla, the successor of Jayasimha, who brought up the child and thus made his name *kumārapāla* significant.<sup>5</sup> He was very brave. Having snatched off the knife from the king of Koṅkaṇ (Mallikārjuna Ś. S. 1078 and 1082) while in the act of jumping from one elephant to another, he cut off his head with it.<sup>6</sup> He received the name *Pratāpalakēśvara*. He married Karpūradēvi, daughter of the (Kalachuri) king of Tripuri (Tēvara near Jubbulpura).<sup>7</sup> He built as many palaces as his brother Vighararāja had destroyed hill-fortresses, and in the midst of them built the big temple of Vaidyanātha. In that temple, he set up an effigy of his father seated on horseback and in the front of it set up his own image made of metal.<sup>8</sup> He also set up the images of Brahmā, Vishnu and Mahēśa at one place in a temple. He built five temples at Ajmer and several others at the village Gaṅgānaka (modern Gangvānā, 9 miles N.E. of Ajmer). Where his father and brother had built only palaces, he founded a town and named it after his father.<sup>9</sup> His wife Karpūradēvi also founded a town.<sup>10</sup> He gave the village of Rēvaṇa to Pārśvanātha. Having placed his minor son Prithvirāja under the protection of Karpūradēvi, he went to Heaven.<sup>11</sup> Inscriptions of his time are dated S. 1226, 1228, 1229, 1230, and 1234.

1 प्रत्यानेतुमिवाकाण्डे पूर्णेऽपि सकलैर्गुणैः ।

पितृवैरितनूजोऽपि प्रतस्थे श्रथिवीभटः ॥ [५६]

*Ibid.*, Canto VIII.

2 *Prithvirājaviṇaya*, Canto VIII, vv. 57-58.

3 *Ibid.*, Canto VIII, v. 59.

4 *Ibid.*, Canto VI, vv. 34-35.

5 *Ibid.*, Canto VII, v. 11.

7 *Ibid.*, Canto VII, v. 16.

9 *Ibid.*, Canto VIII, v. 63.

11 *Ibid.*, Canto VIII, vv. 72-73.

6 *Ibid.*, Canto VII, 15.

8 *Ibid.*, Canto VIII, vv. 66-67.

10 *Ibid.*, Canto IX, v. 34.

31. *Prithvirāja* (III). He was the son of *Sōmēśvara*. As already spoken, he was a minor when his father died. So, during his minority, his mother *Karpūradēvi* managed the affairs of the state with the help of the minister *Kadambavāsa*.<sup>1</sup> During her regency, perfect happiness reigned in the country. When *Prithvirāja* grew up, he attained all the qualifications befitting a prince. He became dexterous in archery and the use of sword and gained several victories. He received a great help in the person of *Bhuvanaikamalla*,<sup>2</sup> the brother of his mother's father, and in the minister *Kadambavāsa*. With their help he did many things for the welfare of the people.<sup>3</sup> He laid siege to *Gudapura*, which was taken possession of by *Nāgārjuna*, son of his uncle *Vigraharāja IV*, and put him to flight.<sup>4</sup> He then brought *Nāgārjuna*'s mother to *Ajmer* along with other warriors in chains, and placed the heads of his enemies on the battlements of the fort of *Ajmer*.<sup>5</sup> He defeated in S. 1239 (A.D. 1182) the *Chandēla* king *Paramardīdēva* of *Jējakabhukti* (*Mahobā*).<sup>6</sup> He determined to destroy the *Muhammadans*, when the latter took possession of *Nādval* (*Nādol* in *Mārwar*).<sup>7</sup> On hearing that he resolved to destroy the *Muhammadans*, the *mlechchha* king *Gori* (*Muhammad Ghuri*) sent a messenger to his court.<sup>8</sup> He then fought a battle against *Muhammad Ghuri* at *Tarāin* 1191 A.D. and utterly defeated him. *Shihābu-d din Ghuri* badly wounded returned to *Ghazni* but next year, he returned to India with a large force and encountered *Prithvirāja* near *Thānēśar*. *Prithvirāja* was captured in the battle that ensued, and put to death shortly afterwards in 1192 A.D.<sup>9</sup> *Ghori* then went to *Ajmer*, took possession of it and, on the promise of a punctual payment of a tribute, delivered over the country to *Gōvindarāja*, son of *Prithvirāja*.<sup>10</sup> His inscriptions are dated S. 1236, 1239, 1244, and 1245.

32. *Harirāja*. He was the brother of *Prithvirāja* (III). Also called *Hēmraj* and *Hirāj*. On hearing that *Gōvindarāja* had accepted to pay a tribute to the *Sultān*, he expelled his nephew from *Ajmer* and forced him to take shelter at *Ranthambhōr*, where the latter founded a separate kingdom for himself.<sup>11</sup> There too, he attacked *Gōvindarāja*, who soon received help from *Qutubu-d-din Ibak*, who marched in person towards *Ranthambhōr*. *Harirāja*, therefore, was obliged to retreat to *Ajmer*. But, not long afterwards he was attacked

<sup>1</sup> *Ibid.*, Canto IX, v. 38.

<sup>2</sup> *Ibid.*, Canto IX, v. 68.

<sup>3</sup> *Ibid.*, Canto IX, v. 89.

<sup>4</sup> *Ibid.*, Canto X, vv. 7, 8, and 32.

<sup>5</sup> *Ibid.*, Canto, X, vv. 36 and 38.

<sup>6</sup> *Ep. Ind.*, Vol. V., Kielhorn's Northern List, No. 176.

<sup>7</sup> *Prithvirājaviṇaya*, Canto X, v. 50.

<sup>8</sup> *Ibid.*, Canto X, vv. 40-42.

<sup>9</sup> *Brigg's Ferishta*, Vol. I, pp. 172-77.

<sup>10</sup> *Ibid.*, pp. 177-78.

<sup>11</sup> *Ep. Ind.*, Vol. XIX, p. 47 n. 1.

by Qutubu-d-dīn and a battle was fought in 1194 A.D., in which he sustained defeat, after which he sacrificed himself in the flames of a pyre<sup>1</sup> Qutubu-d-dīn then appointed a Muhammadan Governor of Ajmer, which henceforth came under the direct rule of the Muhammadans and ceased to be the capital of the Chauhāns. Harirāja's wife was Pratāpadevi and his inscription is dated S. 1251.

### C. THE CHAUHĀNS OF RANTHAMBHŌR.

33. **Gōvindarāja.** As has been said above, Gōvindarāja being driven out of Ajmer by his uncle Harirāja, established a kingdom at Ranthambhōr and thus became the founder of the Chauhāns of Ranthambhōr. Since his time Ranthambhōr became the capital of the Chauhāns.

34. **Bālhaṇadēva.** He succeeded Gōvindarāja and was a tributary to the Sultān Shamsu-d-dīn Altmash (A. D. 1210-35). He had two sons named Pralhādādēva and Vāgbhaṭa.<sup>2</sup>

35. **Pralhādādēva.** He was the elder son of Bālhaṇadēva. He was a just king and ruled mildly. He was placed on the throne during his father's lifetime and his younger brother Vāgbhaṭa was appointed to the post of prime minister. He died of wounds caused by a lion in a hunting expedition.<sup>3</sup>

36. **Viranārāyaṇa.** He was the son of Pralhādādēva. He was haughty and imperious. He fought a battle with the Sultān Jalālu-d-dīn of Delhi A.D. 1290-95), in which neither party obtained the advantage. Jalālu-d-dīn, however, received the presence of Viranārāyaṇa to Delhi through a stratagem, where after a few days he was poisoned and killed.<sup>4</sup> Consequently, Ranthambhōr fell into the hands of Jalālu-d-dīn.

37. **Vāgbhaṭa.** He was the younger brother of Pralhādādēva. Also called Vāhaḍa. Being touched to the quick by some harsh words of his nephew Viranārāyaṇa, he went to Mālwa. After gaining possession of Ranthambhōr, Jalālu-d-dīn sent a message to the Mālwa king that Vāgbhaṭa should be put to death. The king of Mālwa lent a willing ear to this proposal, but Vāgbhaṭa soon discovered the plot. He then murdered the king of Mālwa and possessing himself of the throne, gathered an army, and marched towards Ranthambhōr. The Muhammadan garrison was made to vacate the fort and he became master of Ranthambhōr. He then stationed large forces at different parts of the country along the frontier and thus kept off the enemies. He died after a happy reign of twelve years.<sup>5</sup> He was twice attacked by Ulugh Khān (brother of 'Alān-d-dīn).<sup>6</sup>

<sup>1</sup> Elliot: *History of India*, Vol. II, pp. 225-26.

<sup>2</sup> *Ind. Ant.*, Vol. VIII, p. 62.

<sup>3</sup> *Ibid.*, p. 62.

<sup>4</sup> *Ibid.*, p. 63.

<sup>5</sup> *Ibid.*, p. 63-64.

<sup>6</sup> *Ep. Ind.*, Vol. XIX, p. 47.

38. **Jaitrasimha** was the son of Vāgbhaṭa. He defeated in a battle Jayasimha III of Mālwa and also a ruler of Āmbēr. He handed down the government to his son Hammira and went away as a religious recluse. He had two other sons named Suratrāṇa and Virama, who were great warriors.<sup>1</sup> He died in S. 1339 (A.D. 1283).

39. **Hammira**. He was the son of Jaitrasimha, as already spoken. He was the last Chauhān king of Ranthambhōr, and was endowed with all the qualities of a ruler. He carried a series of successful expeditions against Gadhamandala, Ujjain, Chitrakūṭa (Chitōr), Ābū, Vardhanapura (Badnor), etc., and defeated Arjunavarmā II, and Bhōjarāja II of Mālwa.<sup>2</sup> He was first attacked by Ulugh Khān, younger brother of 'Alāu'ddin in vain, and then by 'Alāu'ddin (A.D. 1296-1315) himself, who after treacherously winning over to his side Hammira's officers named Ratipāla, Raṇamalla and others, succeeded in reducing Hammira to a miserable plight. Hammira, however gave battle with his few remaining followers and fell in it pierced with shafts. With his own hand he severed his head from his body.<sup>3</sup> Thus the rule of the Chauhāns at Ranthambhōr came to an end with Hammira's death in A.D. 1301. His inscription is dated S. 1345.

After the fall of Ranthambhōr, it is said, the descendants of Hammira migrated towards Gujarāt, as may also be concluded from the discovery of an inscription, dated Saṃvat 1525 (A.D. 1469), of the time of the Chauhān king Jayasimhadēva in Gujarāt. It mentions the names of twelve predecessors of Jayasimhadēva, commencing with Rāmadēva, who, therefore, appears to be a near relative of Hammira. Rāmadēva established his capital at Chāmpāner, which remained so till the time of Jayasimha, in whose reign it was conquered by the Sultān Maḥmūd-Begdhā of Gujarāt. Jayasimha was defeated and put to death shortly afterwards on his refusal to embrace Islām. His grandsons, Prithvirāja and Dungarji, however, went away and founded the houses of *Chotā Udayapur* and *Bāriā* (Bombay) respectively. The Chauhāns of these places seem to be thus connected with the celebrated Prithvirāja of Ajmer and the house of Sāmbhar.<sup>4</sup>

Thus we see that the Chauhāns were a mighty race of rulers who had established their rule in Mārwar before<sup>5</sup> the imperial Pratihāras of Kanauj. They, at first, seem to have been independent rulers but later on, had to accept subordination to

<sup>1</sup> *Ind. Ant.*, Vol. VIII, p. 64.

<sup>2</sup> *Ibid.*, p. 64 and *Ep. Ind.*, XIX, pp. 47-48.

<sup>3</sup> *Ind. Ant.*, Vol. VIII, pp. 65-73.

<sup>4</sup> *Ind. Ant.*, Vol. VI, pp. 1-4.

<sup>5</sup> The Chauhāns appear to have established their power in Mārwar about the time when the rule of the Chāvḍās in Mārwar was on the wane in the first quarter of the 8th century A.D. (See *Ante*, Vol. LVII, p. 182.)

the Pratihāras, when the latter became the paramount sovereign in Northern India. After the decay of the Imperial Pratihāras, however, these Chauhāns of Sāmbhar became the sovereign rulers in India. Prithvirāja III of Ajmer, belonging to the main line of Sāmbhar was the last Hindu emperor of India. Even after the death of Prithvirāja, this line of the Chauhāns continued to rule with sufficient power up to a comparatively later period, while their contemporary rulers, viz., the Solāṅkis of Gujarāt, the Parmāras of Mālwa, etc., dwindled into insignificance. From the main line of Sāmbhar, however, other branches of the Chauhāns, such as the Chauhāns of Nāḍol, Sirohi, Bundi, etc., sprang up, which will be dealt with later on.

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## Indo-American Trade, Past and Present.

By J. C. SINHA.

The increase of American trade with India since the outbreak of the Great War has attracted much attention. During the quinquennium 1909-14, the average annual trade of the U.S.A. with India was 5.8 per cent. as compared with 40.0 per cent. of the trade enjoyed by Britain. In 1927-28,<sup>1</sup> the latest year for which trade returns are available, the share of the U.S.A. rose to 9.9 per cent. while that of England dropped <sup>2</sup> to 34.9 per cent. America now ranks second in order of importance among the countries which carry on trade with India. It is interesting to note that America enjoyed the same position during the period of Napoleonic Wars at the beginning of the last century. The respective shares of England, America, and Continental Europe in the trade of British India during the period 1802-3 to 1807-8, were 67 per cent., 21 per cent. and 12 per cent.<sup>3</sup> respectively.

### BEGINNING OF INDO-AMERICAN TRADE.

The American trade with India began in 1785. The War of American Independence which had cut off the supply of Indian goods to the colonists, came to a close on the conclusion of the treaty of Versailles on September 3, 1783. On the 27th of December, 1784, the first American ship, appearing in the Indian seas, arrived at Pondicherry. She was bound for China but having failed in her intended voyage, proceeded to Acheen and from thence to the Coromandel coast. Her cargo consisted of naval stores, wine, and treasure.<sup>4</sup> But the first American ship

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<sup>1</sup> i.e., from 1st April, 1927 to 31st March, 1928, but it may be noted here that towards the close of the 18th and the beginning of the 19th century, the fiscal year, referred to in trade returns, was from the 1st of June to the 31st of May.

<sup>2</sup> Though the United Kingdom's share is now smaller than it was before the War, there has been a slight increase in her share in 1927-28 as compared with the year 1926-27. For the respective shares of the U.K. and the U.S.A. from 1909-14 to 1927-28, see the table towards the end of the paper.

<sup>3</sup> *Papers relating to East India Company's Charter*, ordered by the House of Commons to be printed, Apl. 14, 1812, p. 21. The percentages have been calculated by the present writer from the average annual value of exports and imports during the period of six years from 1802-3 to 1807-8.

<sup>4</sup> Madras letters quoted in *Home Miscellaneous Records* (I.O.) Vol. 605, p. 77.



to go directly to India was the "Hydra" which reached the Hooghly in June 1785, after a voyage of four months from Rhode Island via the Cape of Good Hope.<sup>1</sup> It was allowed to land its cargo in Calcutta under the French flag.<sup>2</sup> Other American ships followed. The Court of Directors agreed to their admission to the British Indian ports as American ships. This recognition put them on a footing of equality with foreign but not with British ships. Thus, the American ships had to pay double the pilotage charge imposed on British ships, for entering the port of Calcutta.<sup>3</sup> But all discrimination against American vessels was removed by a commercial treaty between England and the United States on Nov. 19, 1794. The treaty confirmed to the latter the right of direct trade with British India, a right which up to that time was a "gratuitous license revokable at (the) pleasure" of the Court of Directors. In addition to this privilege, the Americans were put on the same favoured position as British subjects, with respect to import duties.<sup>4</sup> The treaty was ratified by an Act of the British Parliament on the 4th of July, 1797 and remained in force for twelve years.<sup>5</sup>

#### THE JAY TREATY.

The clauses in the treaty which refer to the trade between India and America, are given below :—

"Article 13. His Majesty consents the vessels  
"belonging to the citizens of the United States of America

<sup>1</sup> Bengal letters quoted in *Home Miscellaneous Records* (I.O.) Vol. 605, p. 59. See also pp. 77-78.

For a graphic description of the voyage of an American ship from Calcutta to Philadelphia in 1795-96, see Twining's *Travels in India A Hundred years Ago* (London, 1893).

<sup>2</sup> As early as 1773, ships belonging to foreign factories had been permitted by the English E.I. Company to import at Calcutta but they were required to pay the same duties as if they imported at their own factories. Later on, such ships had to pay the established duties of the port of Calcutta. The "Hydra" was evidently allowed to land its cargo in Calcutta as a French ship, under the above regulations. Though the privilege of importing at Calcutta had been withdrawn from the French in 1775, it must have been restored on the conclusion of peace in 1783. (See *Home Miscellaneous Records* (I.O.) Vol. 494, pp. 101, 103.)

<sup>3</sup> *Home Miscellaneous Records* (I.O.) Vol. 605, p. 68.

<sup>4</sup> The Government duty of 2½ per cent. which was abolished in 1788, was re-established in Calcutta in 1795. Under it, all British and foreign ships importing at Calcutta were liable to 2½ per cent. on their import cargo but foreigners importing in that port, paid on the amount of their invoice with an advance of 60 per cent. British subjects paid on the amount of their invoice only. This privilege was extended to the Americans with the ratification of the treaty.

<sup>5</sup> Macpherson—*The History of European Commerce with India*, (London, 1812) p. 226. See also *Home Miscellaneous Records*, Vol. 524, p. 665, where the Court of Directors observe that "the treaty was at an end on the close of the session of Parliament in 1808."

"shall be admitted and hospitably received in all the sea  
"ports and harbours of the British territories in the East  
"Indies and that the citizens of the said United States may  
"freely carry on a trade between the said territories, and  
"the said United States in all articles of which the  
"importation or exportation respectively to, or from the  
"said territories shall not entirely be prohibited.....  
"The citizens of the United States shall pay for their  
"vessels when admitted into the said ports no other or  
"higher tonnage duty than shall be payable on British  
"vessels, when admitted into the ports of the United  
"States. And they shall pay no other or higher duties or  
"charges on the importation or exportation of the cargoes  
"of the said vessels, than shall be payable on the same  
"articles when imported or exported in British vessels.  
"But it is expressly agreed that the vessels of the United  
"States shall not carry any of the articles exported by them  
"from the said British territories to any port or place  
"except to some port or place in America where the same  
"shall be unladen....."<sup>1</sup>

#### EFFECT OF THE TREATY.

The treaty thus stimulated direct trade between India and the U.S.A. Now, the question arose—did the treaty restrict the right of the Americans of a circuitous trade on their outward voyage to India? The question was decided in the case of *Wilson v Marryat*, before the Court of King's Bench in London on November 21, 1798. The judge was of opinion that the Americans had not been restrained by the treaty to a direct outward voyage to India, though their exports from that country had to be carried direct to some port of the U.S.A. The decision was confirmed in a judgment of the Court of Exchequer on May 6, 1799.<sup>2</sup> This judicial interpretation proved to be a valuable privilege to the Americans. It enabled them to import into India various commodities from the European ports which their ships touched on their way to the East.

Without this circuitous trade, it was difficult for the Americans to export much from India. America was then predominantly an agricultural country and very little of her merchandise was suitable for the Indian market. In 1789, Franklin estimated that the wealth and population employed in trade and manufacture in the U.S.A. represented only  $\frac{1}{3}$ th of

<sup>1</sup> The clauses in this treaty (known as the Jay treaty) relating to Indo-American trade have been quoted from the General Letter from the Court of Directors of the English East India Company dated August 31, 1796.

<sup>2</sup> See *Home Miscellaneous Records* (I. O.) Vol. 491, pp. 67-102, for these two judgments.

that employed in agriculture.<sup>1</sup> The factory system was then just beginning in America, the first cotton factory having been started there only in 1787. This factory, though it obtained aid from the State treasury, was unsuccessful. An English Committee reported in 1791 "that the American cotton manufactures were of a coarse grade, of worse quality and of higher price than those produced at Manchester."<sup>2</sup> But Manchester stuffs were also still far behind the Indian fabrics in point of excellence.<sup>3</sup>

#### WAR BETWEEN FRANCE AND ENGLAND.

With the opening up of commercial intercourse with India, America was naturally anxious to have Indian cotton goods. These formed her chief import from India till 1819-20, when sugar obtained the lead, which again was soon after replaced by indigo. The increase in the export of Indian goods to the U.S.A. till the year 1806-7 was due not merely to the demand of the American market but also for re-exports to Continental Europe, which had been cut off from a considerable portion of the supply of Indian commodities, on account of the war between England and France.

#### DEVELOPMENT OF SHIPPING.

In this war, Holland joined France against England, and India's trade with the French and the Dutch was brought to a close. The Portuguese and the Danish trade however went on till 1806 and 1808 when these two nations were also drawn into the war against England. Thus a considerable part of the carrying trade of the world fell into the hands of America and her merchant marine increased rapidly. Her tonnage which in 1789 was not much in excess of 100,000 exceeded 500,000 in 1795 and 900,000 in 1810.<sup>4</sup>

#### GROWTH OF ENTREPOT TRADE.

The profits in this carrying trade were so high that it paid the Americans to ship Indian goods first to America and then re-export them to Europe. Thus, it is written in the *Report on*

<sup>1</sup> Rabbeno—*The American Commercial Policy* (2nd Edition, 1895) p. 127.

<sup>2</sup> Clive Day—*A History of Commerce* (Longmans, 1907) p. 468.

<sup>3</sup> Though the powerloom had been invented in England as early as 1784, it was imperfect in many ways. The rapid progress of the English cotton industry became possible only after Horrocks's improvements in 1813.

<sup>4</sup> Day—*Op. cit.*, p. 493. This feature was also repeated during the World War which gave a great impetus to American shipping. "From June 1914 to June 1919, according to Lloyd's register of shipping, it increased from 5,500,000 gross tons to 13,091,773 gross tons."

the *External Commerce in Bengal* for 1795-6 "that a very considerable part of piece-goods laden during the last season, will be *reshipped* from America to France or other parts which may appear equally favourable for their disposal."<sup>1</sup> The same statement is practically repeated in the *Report on the External Commerce of Bengal* for 1803-4 where it is said "that many ships clearing out here for America merely proceed to an American port for the purpose of procuring a new set of papers; with these papers (without breaking bulk) they sail for France, and dispose of the produce and manufacture of British India in French port." The total value of American trade (exports and imports) with British India in 1802 was *sicca*<sup>2</sup> rupees 108,31,218 or £1,353,902. In 1806, the value of exports and imports in this trade more than doubled and reached 218,64,303 *sicca* rupees or £2,733,038.<sup>3</sup>

#### BULK OF TRADE WITH BENGAL.

By far the largest part of this trade<sup>4</sup> was carried on with Bengal. This is evident from the following table<sup>5</sup>:-

| AMERICAN IMPORTS (bullion and merchandise) during six years (1802-7) into:- |                      | EXPORTS (bullion and merchandise) to America during six years (1802-7) from:- |                      |
|-----------------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------------|----------------------|
|                                                                             | <i>Sicca rupees.</i> |                                                                               | <i>Sicca rupees.</i> |
| Bengal .. ..                                                                | 364,81,931           | Bengal .. ..                                                                  | 373,85,606           |
| Madras and its Dependencies .. ..                                           | 75,70,122            | Madras and its Dependencies .. ..                                             | 34,94,034            |
| Bombay and Surat .. ..                                                      | 8,73,091             | Bombay and Surat .. ..                                                        | 6,82,150             |
| Total Import S.R. ..                                                        | 449,25,144           | Total Export S.R. ..                                                          | 415,61,790           |

This import trade consisted of S.R. 391,69,500 of bullion and S.R. 57,55,644 of merchandise. In the export trade the

<sup>1</sup> See extracts from the Reports on the External Commerce of Bengal in Vol. 8 (Paper 171), 1812-13 of the House of Commons Papers relating to the East India Affairs.

<sup>2</sup> The *sicca* rupee was the newly coined rupee, converted into current rupee (which was the standard money of account) at the rate of 100 *sicca* rupees to 116 current rupees. On this subject see the present writer's *Economic Annals of Bengal* (Macmillan, 1927). The *sicca* rupees quoted above, have been converted into sterling at the rate of 2s. 6d. per *sicca* rupee, which was then the current rate of exchange. This is evident from the House of Commons Papers on India for 1812-13. Thornton in his edition of Milburn's *Oriental Commerce* (London, 1825) p. 284, also writes: "The current rupee is reckoned at 2s. and a *sicca* rupee of account commonly at 2s. 6d." Macpherson must have confused the *sicca* rupee and the current rupee when he says in p. 423 of his *History of European Commerce* (London, 1812) that "the *sicca* rupee may be valued upon an average, at two shillings sterling."

<sup>3</sup> Macpherson—*Op. cit.*, p. 423.

(See footnotes <sup>4</sup> and <sup>5</sup> on next page.)

great bulk was merchandise. The amount of bullion exported during the six years amounted to S.R. 154,176 only out of the total export of S.R. 415,61,790.

#### LOADING OF CARGO IN CALCUTTA.

It was but natural that the great bulk of the Indo-American trade passed through Calcutta. A graphic account of the loading of cargoes in an American ship in this port, is given in an official report for 1799-1800 :—

“The first day is employed in moving into a small house hired by the *banian*, previous to the ship's coming to anchor, delivering the register to the Police Office, and manifest at the Custom House. The second in putting up screws for the bale

<sup>4</sup> Some idea of the items of merchandise in the Indo-American trade of this period may be had from the following account :—

| AMERICAN imports into India in 1805.            |                      | INDIAN exports to America in 1805.              |                      |
|-------------------------------------------------|----------------------|-------------------------------------------------|----------------------|
|                                                 | <i>Sicca rupees.</i> |                                                 | <i>Sicca rupees.</i> |
| Wine ..                                         | 11,77,650            | Piecegoods ..                                   | 60,43,576            |
| Cyder ..                                        | 332                  | Sugar ..                                        | 11,69,261            |
| Coffee ..                                       | 3,893                | Indigo ..                                       | 2,13,890             |
| Cordage ..                                      | 1,780                | Cotton ..                                       | 1,18,592             |
| Metals ..                                       | 1,44,049             | Camphire ..                                     | 6,416                |
| Timber and plank ..                             | 39,833               | Ginger ..                                       | 13,511               |
| Spices ..                                       | 55,687               | Seeds ..                                        | 1,000                |
| Oilman's stores ..                              | 14,299               | Hemp, flax, and twine ..                        | 13,051               |
| Piecegoods ..                                   | 25,096               | Canvas and gunnies ..                           | 22,810               |
| Broadcloth ..                                   | 2,630                | Sundries ..                                     | 25,037               |
| Sundries ..                                     | 1,18,828             |                                                 |                      |
| Total import of merchandise S.R. ..             |                      | Total export of merchandise S.R. ..             | 76,27,144            |
| Bullion S.R. ..                                 |                      | Re-exports ..                                   | 88,067               |
|                                                 |                      | Total S.R. ..                                   | 77,15,211            |
|                                                 |                      | Export of bullion ..                            | Nil                  |
| Total import of merchandise and bullion S.R. .. |                      | Total export of merchandise and bullion S.R. .. | 77,15,211            |
|                                                 |                      |                                                 |                      |

For this list of imports and exports see Appendix 47 to the Fourth Report from the *Select Committee on the Affairs of East India Company*, 1812, p. 146, or Milburn's *Oriental Commerce* (London, 1813) Vol. II, p. 135. Items of merchandise in the American trade with Bengal, Madras, and Bombay in 1805 are also separately shown in Milburn. It is interesting to note that gunny was exported from Bengal to America as early as 1805.

<sup>5</sup> The above table is based on the figures given in Macpherson's *History*, p. 423.

goods, and settling through the means of the *banian*, the prices of sugar. . . . . The receipt of the sugar is subsequently entrusted to the care of an officer of the ship, while the captain superintends the receipt of bale goods, generally to the extent of 3,000 pieces per diem, thus in the course of 20 or 25 days, a vessel of 300 tons burthen will have her homeward cargo on board."<sup>1</sup> It appears from the *Report on the External Commerce of Madras* for 1811-12 that of late years American ships, after completing the more valuable part of their cargoes in Calcutta, proceeded to Madras for such piecegoods as were required from that port.<sup>2</sup>

### BULLION THE CHIEF IMPORT INTO INDIA.

One great obstacle to the progress of this trade was that America had few exportable goods to India in those days. In this respect she was in a weaker position than European countries. During the period of six years from 1802-3 to 1807-8 the treasure exported by the Americans to British India was almost seven times as large as the amount of goods in value.

<sup>1</sup> A statement of the different items and value of merchandise exported from Calcutta by the Americans during the decade 1796-7 to 1805-6, is given below from *Home Miscellaneous Records* (I.O.) Vol. 494, p. 309:—

| Year ending 31st May. |    | PIECE-GOODS. | INDIGO.   | SUGAR.    | SUNDRIES. | TOTAL.     |
|-----------------------|----|--------------|-----------|-----------|-----------|------------|
|                       |    | Sicca Rs.    | Sicca Rs. | Sicca Rs. | Sicca Rs. | Sicca Rs.  |
| 1796-97               | .. | 20,77,886    | 50        | 3,34,284  | 1,48,085  | 25,60,305  |
| 1797-98               | .. | 14,38,667    | Nil       | 5,19,833  | 67,102    | 20,25,602  |
| 1798-99               | .. | 8,30,459     | "         | 1,70,860  | 1,61,858  | 11,63,177  |
| 1799-1800             | .. | 28,44,333    | "         | 6,59,340  | 2,82,264  | 37,85,937  |
| 1800-1                | .. | 52,36,364    | "         | 5,50,513  | 3,19,856  | 61,06,733  |
| 1801-2                | .. | 41,52,244    | "         | 3,10,379  | 1,03,205  | 45,65,828  |
| 1802-3                | .. | 40,21,943    | 66,256    | 5,04,594  | 3,17,112  | 49,09,905  |
| 1803-4                | .. | 54,50,835    | 33,716    | 8,53,313  | 4,22,192  | 67,60,056  |
| 1804-5                | .. | 24,89,599    | 77,386    | 6,53,332  | 1,24,276  | 33,44,593  |
| 1805-6                | .. | 47,63,132    | 2,13,890  | 11,69,261 | 1,31,772  | 62,78,055  |
| Total                 | .. | 333,05,462   | 3,91,298  | 57,25,709 | 20,77,722 | 415,00,191 |

N.B.—*Sicca* rupees may be converted into sterling at the rate of 2s 6d. per *sicca* rupee.

<sup>2</sup> See Vol. 9 (Paper 46) 1813-14 of the House of Commons Papers relating to the East India Affairs.

The ratio of goods to bullion in the export of the foreign Europeans (*i.e.* the Europeans who were not British subjects) to India during the same period was 1 : 2.<sup>1</sup>

Fortunately for the Americans, mercantilism had become an obsolete policy at the time. There was no bullionist like Milles or Malynes to oppose the export of bullion to India. Yet the scarcity of circulating medium in America after the War of Independence made it difficult to spare a large quantity of precious metals.

Various devices were therefore adopted to reduce the import of bullion into India and to raise there funds for the purchase of Indian products. We learn from the *Report of the Import and Export Trade of Calcutta* for 1796-7 that in the previous year tracts of American lands had "been offered, either for sale or barter for merchandise but without success." But bills drawn from America on individuals in Calcutta for the purchase of American stock met with a better fate. The exports to America exceeded the imports into Bengal during the three years from the 1st June, 1795 to the 31st May, 1798 by *sicca* rupees 31,02,189 or £ 387,774. Out of this sum the bills drawn (a) from America on persons in Calcutta for the purchase of American stock and (b) from London on agency houses<sup>2</sup> in Calcutta were estimated at £ 37,500 and £ 100,000<sup>3</sup> respectively.

<sup>1</sup> *Papers relating to East India Company's Charter*, ordered by the House of Commons to be printed April 14, 1812, p. 20. Statistics of American imports into Madras and Bombay before 1802 are not available but the trade returns of Bengal during the period 1795-96 to 1799-1800 give a fair idea of the ratio of bullion to merchandise in Indo-American trade. It appears from these reports that the ratio of goods to bullion in the import trade of Bengal during the quinquennium was 1 : 6 in the case of the Americans and 1 : 2 in the case of foreign Europeans. See *Home Miscellaneous Records*, Vol. 494, p. 77.

<sup>2</sup> The origin and functions of such agency houses are thus described by Thomas Bracken, a partner of the agency house of Messrs. Alexander & Co. of Calcutta, before the Select Committee of the House of Commons on the Affairs of the East India Company on the 24th of March, 1832 :—

"The commerce of Calcutta was in the hands of a very small number of houses before the opening of the present charter (*i.e.*, of 1813); previous to that time, the houses were chiefly formed of gentlemen who had been in the civil and military services, who, finding their habits perhaps better adapted for commercial pursuits, obtained permission to resign their situations, and engage in agency and mercantile business. They had of course a great many friends and acquaintances in their respective services and from these gentlemen they received their accumulations. They lent them to others or employed them themselves for purposes of commerce."

<sup>3</sup> These figures have been taken from the *Report on the Private Trade between Europe, America and Bengal* from the 1st June, 1795 to the 31st May, 1800, in Vol. 8 (Paper 171) 1812-13 of the House of Commons Papers relating to the East India Affairs.



## HANDSOME PROFITS.

But, as has been already said, by far the largest part of the Indian exports to America was in those days purchased with the shipment of bullion. In spite of this, the trade with British India, was very profitable to the Americans. It is stated in the *Report on the External Commerce of Bengal* for 1796-97 that "the net profit of a voyage to Bengal, if the ship brings dollars, is estimated at 60 per cent. after the payment of every charge incidental thereto, and debiting the adventure with an interest at the rate of 7 per cent. per annum. This profit is generally realised in fifteen months." The *Report* for 1799-1800 also shows that the Americans derived considerable profits from this trade.

## REASONS.

The large profits of the Americans were mainly due to their neutrality during the War in Europe. They had not to pay heavy duties, freights and insurance rates like the belligerent nations. On the other hand, they had a ready access to the ports of France and her allies from which the English East India Company and private British traders had been shut out. Another reason for their success was their economical management. As the writer of the *Report on the External Commerce of Bengal* for the year 1803-4, observes "the enterprising spirit of these (American) merchants, the comparative trifling expense attending the outfit and navigation of their ships, the facility with which they purchase their goods here, added to their strict attention to economy in all commercial transactions are circumstances from which collectively they derive considerable profits, whether it is in the purchase of their cargoes here, or the disposal of them elsewhere."

Their economical management was partly due, as stated in the *Report of the External Commerce of Bengal* for 1799-1800, to the fact that they seldom, if ever applied "to Christians of any denomination for their homeward cargo." Unlike the other foreign traders who dealt exclusively with the European agency houses, the Americans transacted their business through Indian merchants or brokers whose charges were much lower.<sup>1</sup> The most important of them was Ramdoolal De, a Bengali gentleman who began his career as a clerk on Rupees four or

<sup>1</sup> Referring to the lower charges of Indian houses which transacted the greater part of the American trade in Calcutta even during the first quarter of the last century, Bracken observed, in the course of his evidence before the Select Committee of the House of Commons in 1832, "The English houses would charge probably 2½% on the purchase of an investment, and the native would not charge more perhaps than 1½ per cent."



five a month and rose to the position of one of the foremost merchants in Calcutta. He died in 1824, leaving a large fortune of about £400,000.<sup>1</sup>

#### BLOCKADE BY ENGLAND AND FRANCE.

The economy of management in the Indo-American trade was, however, of little avail against the general blockade declared by France and England against each other in 1806 and 1807. America hoped that if she could prohibit her own exports necessary for war purposes, England and France might be induced to revoke their measures against neutral commerce. With this end in view, in December 1807, America embargoed her own ports and expressly prohibited the trade of her own subjects, except under a special licence from the President of the United States. The blockade in Europe, however, was not removed. In March, 1809 America declared non-intercourse with France, England, and their allies. The result was a considerable falling off in the trade between India and America. The official reporter on the external commerce of Bengal observes in his Report for 1811-12 "with America our intercourse has almost entirely failed; the importation thence amounts to the trifling sum of S. R. 585,434 (£73,179) which includes S.R. 459,869 (£57,484) of specie." Even this declining trade came to end on account of the War between England and America from 1812-1814. On December 24, 1814 a treaty of peace was signed between the two countries and this was followed next year by a general peace in Europe.

#### TRADE RESUMED AFTER PEACE.

After the conclusion of peace, the Americans were the first among western traders to renew their commercial intercourse with India. The main features of their trade remained unchanged. Though bullion was their chief import, they sold in Calcutta bills on London to the extent of two to three hundred thousand pounds a year and purchased what they wanted with the proceeds.

But there was one important change. Indian cotton goods no longer formed the chief article of export to America. The reason is that Indian fabrics had been superseded partly by English and partly by American products. During the war with England, the American cotton industry underwent a rapid expansion. In 1808 there were 15 cotton mills in America, with 8,000 spindles. In 1815, the number of spindles rose to 130,000 and in 1830 it reached 1, 246,000.<sup>2</sup>

<sup>1</sup> Evidence before the Select Committee of the House of Commons on the Affairs of the East India Company, 1833, Vol. II, p. 221.

<sup>2</sup> Lippincott—*Economic Development of the United States*, p. 203.

With the progress of factory production, there was a decline in the price of cotton products. "In the United States the price of ordinary cloth for sheeting produced by the family weaver in 1815 was about 40 cents a yard; in 1830 it was about 8 cents a yard."<sup>1</sup> It was but natural therefore that the American demand for Indian cotton goods should fall off. On the other hand, the Americans brought to India a portion of those excessive supplies of English cotton goods which had been dumped into the U.S.A. after the restoration of peace.

The chief Indian exports to America at the time were indigo, silk, and saltpetre. This trade reached its high-water mark in 1818-19, after which year it began to decline.

#### DECLINE OF TRADE AND ITS CAUSES.

The causes of this decline are not far to seek. The immediate cause was probably the severe crisis in America in 1818-19, but the deeper cause was her industrial development, the foundation of which had been laid during the war with England. This turned the attention of the U.S.A. from foreign commerce to domestic trade and industries. At the same time, the competition of other European nations who resumed trade with India, made the American trade with Continental Europe in Indian products less profitable. The high tariff in the U.S.A. from 1816 to 1842 tended also to discourage her foreign trade. In India, at the same time, the old handicrafts were on the decline, while for Indian food-grains and raw materials there was little demand in America.

America did require Indian gunnies (in those days woven in handlooms) even in the 'Thirties<sup>2</sup> of the last century, for wrapping round her bales of raw cotton. In 1850-51, out of 793,299 *maunds* of raw jute, valued at Rupees 1,970,715 and 9,035,713 pieces of handloom woven gunny bags and cloth, valued at Rupees 2,159,782 exported from Calcutta, North America took 9242 *maunds* of raw jute and 2,290,427 pieces of gunnies and gunny cloth.<sup>3</sup> But this American demand was not sufficiently extensive to maintain a large trade with India, for there was an alternative source of supply from Dundee where jute manufactures had been started as early as 1835.

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<sup>1</sup> Lippincott—*Op. Cit.*, p. 204.

<sup>2</sup> According to "*Comparative view of the External Commerce of Bengal during the years 1829-30 and 1830-31*" (Calcutta 1831) the chief articles of export to America on which there had been an increase, were indigo, saltpetre, silk piecegoods, shellac, gum, ginger, *gunnies* (italics are ours), hides and skins. Upon exports like tincal, borax, safflower, turmeric, there was a decline. Even in 1805, handloom-woven gunny was exported to America from Bengal.

<sup>3</sup> Wallace—*The Romance of Jute*, (second edition) p. 4.

## TRADE IN THE 'EIGHTIES.

In spite of America's industrial progress in the 'Eighties<sup>1</sup> of the last century, her trade with India continued to be small. The percentage of the total trade of India shared by America in 1884-85 was 3·07 as against 55·3 enjoyed by the United Kingdom.<sup>2</sup> The chief Indian exports to the U.S.A. at the time were indigo, hides and skins, raw jute, gunny bags and cloths and shellac. America and Australia were the chief markets for Indian gunny bags in those days. Out of 82·7 millions of jute bags<sup>3</sup> exported from India in 1884-85, 22·2 millions went to the U.S.A., 18·7 millions to Australia, 17·6 millions to Straits Settlements and only 7 millions to the United Kingdom.<sup>4</sup> The amount of Indian gunny cloth exported at the time was small. In 1884-85, 15·3 million yards of such cloth were shipped from India and most of it went to the U.S.A. Indian tea was then an occasional export to America. The exertions of the Calcutta Tea Syndicate led to an increase in the export of Indian tea to America from 17,405 lbs. in 1878-9 to 676,507 lbs. in 1882-83 but this increase could not be maintained. The official reviewer of the trade of British India for 1884-85 observes "the efforts made to open a trade (in Indian tea) with the United States have been so far unsuccessful and Chinese and Japanese teas still hold their ground there." Up to the outbreak of the Great

<sup>1</sup> The following table taken from the *Commerce Yearbook* 1928, Vol. I, p. 15 (U.S.A. Government Printing Office, 1928) shows the progress of manufacturing industries in the U.S.A. :—

| Year | Number of wage earners | Horse power of prime movers | Value added to materials | Wholesale price index |
|------|------------------------|-----------------------------|--------------------------|-----------------------|
| 1869 | 2,054,000              | 2,346,000                   | 1,395,000,000            | 135                   |
| 1879 | 2,733,000              | 3,411,000                   | 1,973,000,000            | 85                    |
| 1889 | 4,252,000              | 5,939,000                   | 4,210,000,000            | 83                    |
| 1899 | 4,713,000              | 10,098,000                  | 4,831,000,000            | 75                    |
| 1909 | 6,615,000              | 18,675,000                  | 8,529,000,000            | 97                    |
| 1919 | 9,000,000              | 29,422,000                  | 24,809,000,000           | 206                   |
| 1925 | 8,384,000              | 35,735,000                  | 26,775,000,000           | 159                   |

<sup>2</sup> *Review of the Trade of British India*, 1884-85, p. XXII. America's share of the total trade of India in 1882-83 and 1883-84 were 2·89 per cent. and 2·35 per cent. respectively.

<sup>3</sup> It is interesting to note that of the 82·7 millions of jute bags exported, 4·9 millions were woven in hand-looms and the rest in power-looms.

<sup>4</sup> *Review of the Trade of British India*, 1884-85, p. LVI.

War, the bulk of the tea imported into the U.S.A. came from Japan and China.<sup>1</sup>

Fifty years ago, the only important American export to India and which is even now one of the chief exports, was mineral oil. In 1878-79, the total quantity of American mineral oil, chiefly kerosene, imported into India was three million gallons, valued at Rs. 21 lacs. In 1882-83, it reached 20 million gallons, valued at Rs. 86.9 lacs. The total American export to India this year was worth only Rs. 93.4 lacs; in other words, mineral oil formed 93 per cent. of the total import from America. Mr. O'Connor writes in the *Review of the Trade of British India* for 1882-83, "this (American) oil has flooded the country, it has penetrated everywhere and is used very largely by natives of all classes to the great advantage of their domestic economy."

#### COMPETITION OF RUSSIAN OIL.

But in 1886-87 a small quantity of Russian kerosene was first imported into India. Though inferior in quality, it was cheaper, being imported in bulk from a much shorter distance than the American oil, packed in cans and wooden cases. By the end of the century, Russian oil dominated the Indian market, a comparatively small amount being imported from the U.S.A. to meet the demand of the Europeans in India and the wealthier classes of Indians.<sup>2</sup>

<sup>1</sup> The import of tea into the U.S.A. (values in thousands of dollars) from the leading countries is given below, from the *Commerce Year Book* 1926, Vol. I, p. 110:—

| Total Import of Tea into United States of |    |    |    | 1910-14. | 1925.  | 1926.  |
|-------------------------------------------|----|----|----|----------|--------|--------|
| America                                   | .. | .. | .. | 16,732   | 31,454 | 31,349 |
| From U.K.                                 | .. | .. | .. | 3,180    | 9,334  | 8,173  |
| " China                                   | .. | .. | .. | 2,898    | 2,586  | 3,016  |
| " Japan                                   | .. | .. | .. | 7,957    | 6,456  | 6,898  |
| " British East Indies                     | .. | .. | .. | 1,721    | 9,357  | 9,152  |

<sup>2</sup> The quantity of kerosene imported into India during the decade 1896-97 to 1905-6, is given below, in thousands of gallons:—

|                                   | 1896-97 | 1897-98 | 1898-99 | 1899-1900 | 1900-1 | 1901-2 | 1902-3 | 1903-4 | 1904-5 | 1905-6 |
|-----------------------------------|---------|---------|---------|-----------|--------|--------|--------|--------|--------|--------|
| Russia                            | 45,484  | 50,684  | 50,800  | 57,688    | 67,851 | 84,478 | 71,125 | 57,320 | 40,804 | 7,617  |
| U.S.A.                            | 18,202  | 23,985  | 21,006  | 12,732    | 5,102  | 5,768  | 9,229  | 6,722  | 7,477  | 22,332 |
| Borneo                            | ...     | ...     | ...     | ...       | ...    | ...    | ...    | 2,572  | 9,281  | 5,193  |
| Straits                           | ...     | ...     | ...     | ...       | ...    | ...    | ...    | ...    | ...    | ...    |
| Settle-<br>ments                  | 164     | 597     | 823     | 42        | 143    | 1,023  | 522    | 3,783  | 11,969 | 10,391 |
| Sumatra                           | 538     | 7,541   | 4,444   | ...       | ...    | ...    | 286    | 1,348  | 5,943  | 5,401  |
| Other                             | ...     | ...     | ...     | ...       | ...    | ...    | ...    | ...    | ...    | ...    |
| Foreign<br>Countries              | 63      | 98      | 52      | 8         | 6      | 198    | 289    | 14     | 1,216  | 15     |
| Total for<br>Foreign<br>Countries | 64,471  | 82,795  | 76,625  | 70,470    | 72,602 | 91,467 | 81,451 | 71,559 | 76,190 | 50,949 |
| Coastwise<br>from Burma           | 40      | 1,709   | 2,308   | 4,966     | 8,269  | 13,463 | 17,450 | 35,206 | 42,729 | 47,160 |

(From the *Review of the Trade of India* in 1905-6, p. 15.)

As the chief import from America was thus affected by Russian competition, the import trade became stagnant.<sup>1</sup> The export trade showed also no tendency to increase. The official reviewer of the trade of British India for 1898-99 writes, "the Americans do not now take Indian linseed . . . . . Indigo is in a stationary condition, and tanned skins are in declining demand. As a set-off the trade in gunny cloth has . . . . . more than doubled in five years and an increase in raw skins has compensated for the reduction in the demand for tanned skins."

#### GROWTH OF TRADE FROM 1905-6.

From 1905-6, the Indo-American trade showed on the whole a steadily upward tendency.<sup>2</sup> In that year the Standard Oil Company of America regained its position in the oil trade of India. The Baku riots of 1905 led to a considerable falling off in the production of Russian oil and from that time its export

<sup>1</sup> The exports and imports in Indo-American trade during the quinquennium ending in 1898-99 are as follows:—

| Year.   | Value of mineral oil imported into India from the U.S.A. in tens of rupees. | Value of total import into India from the U.S.A. in tens of rupees. | Value of total Indian export to the U.S.A. in tens of rupees. |
|---------|-----------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|
| 1894-95 | 975,522                                                                     | 1,106,441                                                           | 5,842,397                                                     |
| 1895-96 | 963,371                                                                     | 1,139,438                                                           | 5,913,896                                                     |
| 1896-97 | 907,391                                                                     | 1,466,949                                                           | 4,818,498                                                     |
| 1897-98 | 1,080,520                                                                   | 1,431,075                                                           | 5,876,095                                                     |
| 1898-99 | 954,919                                                                     | 1,362,670                                                           | 5,387,304                                                     |

The above table is based on figures taken from the *Review of the Trade of India*, 1894-95, p. 67 and 1898-99, p. 58.

<sup>2</sup> Share of the U.S.A. in the import trade of India:—

1901-2 1902-3 1903-4 1904-5 1905-6 1906-7 1907-8 1908-9 1909-1914  
1.4% 1.5% 1.5% 1.1% 2.2% 2.4% 2.5% 2.7% 3.1%

Share of the U.S.A. in the export trade of India:—

1901-2 1902-3 1903-4 1904-5 1905-6 1906-7 1907-8 1908-9 1909-1914  
6.9% 6.7% 6.0% 6.3% 8.2% 9.0% 7.8% 8.8% 7.5%

has not been large, the bulk of the reduced output being consumed in the domestic market.<sup>1</sup> From 1905 the policy of the Standard Oil Company has been to follow the prices fixed in India by the Royal Dutch and the Burmah Oil Company's organization. The high prices maintained by this combination and the superior quality of American oil, have enabled the Standard Oil Company to supply the bulk of the kerosene which is now imported into India.<sup>2</sup> Apart from this activity in the oil trade, the American business concerns made no systematic attempt before the Great War to expand their trade with India. In spite of this, America was the third in order of importance among foreign countries, having trade with India, during the quinquennium 1909-14. Her trade, during the period, was exceeded only by the trade of the United Kingdom and of Germany and was closely followed by the share of Japan.

During that quinquennium, America's average annual shipment to India, amounted to Rs. 449 lacs out of which about 49 per cent. was mineral oil and the rest consisted chiefly of iron and steel, raw cotton, cotton piecegoods, hardware, machinery and motor vehicles. The average annual exports to America during the period were raw hides and skins of the value of Rs. 349 lacs, raw jute valued at Rs. 233 lacs and gunny bags and cloth worth Rs. 784 lacs out of the total average export amounting to Rs. 1684 lacs.<sup>3</sup>

<sup>1</sup> During the last few years a large quantity of Russian oil was imported into India by the two rival combinations which are now contending for the Indian market. During the three years ending in 1925, the Asiatic Petroleum Company, a subsidiary of the Royal Dutch Shell Group, imported into India and Ceylon 23,880,000 imperial gallons of Russian oil and up to the end of 1927 the Standard Oil Trust imported 21,000,000 imperial gallons of Soviet oil into India. It was the import of this oil that led the Royal Dutch Shell Group to declare the kerosene price war of 1927 against the Standard Oil Company. (See *Representations received by the Indian Tariff Board . . . regarding the grant of protection to the Oil Industry*, Vol. I (1928), p. 95.

<sup>2</sup> The following table shows the import of kerosene oil into India from the U.S.A., during the three years ending in 1926-27 and in the pre-war year 1913-14, in thousands of gallons.

|                                         | 1913-14 | 1924-25 | 1925-26 | 1926-27 |
|-----------------------------------------|---------|---------|---------|---------|
| From the U.S.A. . . . .                 | 42,311  | 54,224  | 56,249  | 55,585  |
| Total import from all foreign countries | 68,850  | 71,980  | 79,222  | 64,050  |

The coastwise imports of kerosene oil from Burma to India amounted to 130 million gallons in 1926-27 as compared with 128 million gallons in 1925-26 and 124 million gallons in 1924-25. Thus about two-thirds of India's requirement is supplied by Burma and of the remaining one-third, the great bulk comes from the U.S.A.

<sup>3</sup> *Review of the Trade of India in 1926-27*, p. 175.

## RAPID EXPANSION SINCE THE WAR.

Though the chief items of export and import have changed but little, the value and volume of the American trade with India have increased much since the outbreak of the World War. This tendency is found in America's trade with other Asiatic countries also. The proportion of American exports going to Europe was 76.7 per cent. of the total export trade of the U.S.A. in 1896-1900. This declined to 47.6 per cent. in 1927 whereas American exports to Asia increased during the same period from 3.9 to 11.5 per cent. In the import trade also, Europe's share declined from 52.6 per cent. in 1896-1900 to 30.5 per cent. in 1927 but Asia's share rose from 14.6 to 30.0 per cent. during the same period.<sup>1</sup> In fact, America's trade with all the continents other than Europe improved during the last 27 years. This change in the distribution of American trade is mainly due to her transformation from an agricultural to a predominantly industrial country. She has established to a much greater extent than before the War direct trading with non-European sources of the supply of raw materials which formerly reached her through Europe. She has started also trade organizations of her own in the East. "Before the War," writes Mr. Ainscough, "there were practically no American merchant importers of high standing in India. The last few years, however, have witnessed the opening of a few large firms, who are already doing a considerable trade."<sup>2</sup> Improved shipping and banking facilities between the United States and India have also largely contributed to the expansion of trade. In addition to these factors, the outbreak of the War led the Indian importers to substitute Japanese and American goods for those which had formerly been supplied by Europe. The progress of trade since the War, may be seen from the table on the next page.

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<sup>1</sup> *Commerce Year Book*, 1928 (U.S.A.), Vol. I, Table 20, p. 114.

<sup>2</sup> Ainscough—*Report on the Conditions and Prospects of British Trade in India at the close of the War* (1919) p. 13.

| Countries.     | PRE-WAR AVERAGE<br>1909-14. |                               |              | WAR AVERAGE.<br>1914-19. |                               |              | POST-WAR AVERAGE<br>1919-24. |                               |              | 1925-1926. |                               |              | 1926-1927. |                               |              | 1927-1928. |                               |              |
|----------------|-----------------------------|-------------------------------|--------------|--------------------------|-------------------------------|--------------|------------------------------|-------------------------------|--------------|------------|-------------------------------|--------------|------------|-------------------------------|--------------|------------|-------------------------------|--------------|
|                | Imports.                    | Exports including re-exports. | Total trade. | Imports.                 | Exports including re-exports. | Total trade. | Imports.                     | Exports including re-exports. | Total trade. | Imports.   | Exports including re-exports. | Total trade. | Imports.   | Exports including re-exports. | Total trade. | Imports.   | Exports including re-exports. | Total trade. |
| United Kingdom | 62.8                        | 25.1                          | 40.0         | 56.5                     | 31.1                          | 41.2         | 57.6                         | 24.2                          | 39.5         | 51.4       | 21.0                          | 32.1         | 47.8       | 21.5                          | 32.8         | 47.7       | 25.4                          | 34.9         |
| U.S.A.         | 3.1                         | 7.5                           | 5.8          | 7.0                      | 11.9                          | 9.9          | 8.5                          | 12.0                          | 10.4         | 6.7        | 10.4                          | 9.0          | 7.9        | 11.1                          | 9.7          | 8.2        | 11.2                          | 9.9          |
| Japan          | 2.5                         | 7.5                           | 5.5          | 10.4                     | 11.2                          | 10.9         | 6.9                          | 13.3                          | 10.4         | 8.0        | 15.0                          | 12.4         | 7.1        | 13.3                          | 10.7         | 7.2        | 8.9                           | 8.1          |
| Germany        | 6.4                         | 9.8                           | 8.5          | .7                       | .9                            | .8           | 2.8                          | 4.9                           | 4.0          | 5.9        | 7.0                           | 6.6          | 7.3        | 6.6                           | 6.9          | 6.1        | 9.8                           | 8.2          |



## PERMANENT INCREASE.

It appears from the table that the U.S.A., after a temporary decline in 1925-26, more than regained during the last two years her average import during the War period. This Post-war development of American trade is somewhat different from the progress of Indo-American commerce at the beginning of the last century. The latter was due not to America's industrial strength but to some fortuitous causes. As soon as those causes disappeared, American trade declined. But the progress of the trade of the U.S.A. since the outbreak of the Great War, is due not merely to the temporary diversion of trade from the belligerent nations. It is mainly due, so far as the export of American manufactures is concerned, to the factors that have brought about mass production in the U.S.A. with the consequent reduction of prices. A substantial part of the recent American trade with India has, therefore, come to stay.

## COMPETITION BETWEEN ENGLAND AND AMERICA.

About a hundred years ago, John Bell in "*A Comparative View of the External Commerce of Bengal during 1830-31 and 1831-32*" observed, "The trifling attempt at rivalry (with England) which America has yet displayed in this market, ought to be no indication of her future inability". At present, American competition with English goods is keen in certain branches of Indian trade. "The outstanding features of the year", writes Mr. Ainscough in his Report for 1927-28, "have been intensified American competition in machinery, motor cars, rubber tyres, electrical apparatus and fents".

Of these items, machinery constitutes an important element of the British trade with India. Machinery and mill-work contributed 10.5 per cent. of the total British imports to India in 1927-28. Though the share of the United Kingdom in this trade is now less than it was in 1913-14, she improved her relative position in 1927-28, as compared with the previous year.<sup>1</sup> In the chief Indian industries like cotton, tea and jute, the machinery now in use is almost entirely British. Other things being equal, the demand for the type of machinery with

<sup>1</sup> The shares of the three chief suppliers in the trade in machinery before the War and during the last 2 years have been as follows :—

|                 | 1913-14         | 1926-27         | 1927-28         |
|-----------------|-----------------|-----------------|-----------------|
| United Kingdom  | .. 90 p.c.      | 78.2 p.c.       | 78.5 p.c.       |
| U.S.A. ..       | .. 3 p.c.       | 10.2 p.c.       | 10.1 p.c.       |
| Germany ..      | .. 6 p.c.       | 7.0 p.c.        | 6.7 p.c.        |
| Other Countries | .. 1 p.c.       | 4.6 p.c.        | 4.7 p.c.        |
|                 | <u>100 p.c.</u> | <u>100 p.c.</u> | <u>100 p.c.</u> |

which industrial workers are already familiar, will naturally continue. American competition has touched only the fringe of the machine trade of India and is generally keen only in those types of machinery where "low first cost rather than quality and efficiency is the desideratum". But "the British machinery manufacturer" as Mr. Ainscough observes in his latest report, "enjoys a very high reputation in the market, his selling and technical organisation in the country is second to none". Excepting agricultural machinery,<sup>1</sup> the demand for which is limited in a land of small holdings like India, America is not likely to capture in the near future any substantial part of the trade in machinery.

In the automobile trade, America now holds a predominant place.<sup>2</sup> The size of the American domestic market, unimpeded by tariff barriers, has enabled her to make mass-produced cheap cars and commercial vehicles on a scale, which is not yet possible in any other country. But the output of British motor industry has increased much in recent years, with the result that the prices of cars and commercial vehicles in 1928, corrected by the cost of living index, are 50.1 per cent. and 38 per cent. respectively below the pre-war level.<sup>3</sup> Though the lowest priced British car is still more expensive than certain cheap American cars yet the superior finish and durability<sup>4</sup> of the former are increasing its sales in India. Excepting Morris cars, which are as nearly mass-produced as is possible in Great Britain, British and American cars cater for the requirements of different classes of consumers in India and the range of direct competition between the two kinds of cars is limited. The same remark is applicable to the trade in British and American lorries and buses. The more costly and heavy British vehicles have a sale among certain British firms in

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<sup>1</sup> In the production of agricultural machinery, America has a decided advantage of mass production due mainly to the enormous size of her domestic market.

<sup>2</sup> It may be noted here that the American position is strong in the trade in motor cars and commercial vehicles but not in motor cycles. The reason is that the domestic market for American motor cycles is very limited and mass production is not possible there to the same extent as is carried on in automobiles. Thus, the total output of passenger cars and trucks in America in 1927 was 3,394,000. Out of this enormous production only 11.3% was exported. The total output of motor cycles in America in 1925 (figures for later years are not available) was only 39,000 and of this 59% was exported.

<sup>3</sup> *The Motor Industry of Great Britain*, 1928, by the Society of Motor Manufacturers and Traders Ltd. p. 77.

<sup>4</sup> According to *The Motor Industry of Great Britain*, 1928, the average life of British cars is 11 years. The National Automobile Chamber of Commerce, U.S.A. in their *Facts and Figures of the Automobile Industry*, 1928, observe that the average life of American cars is 7 years. In India, the average life of both British and American cars is somewhat lower but there is no doubt that the British car is more durable.

India, while the Indian concerns prefer cheap American and Canadian vehicles having a much shorter life. There is thus no immediate possibility of America ousting Great Britain from her share in the automobile trade of India.

The remaining items like rubber tyres, electrical apparatus, cinematograph films, rubber soled shoes, toilet requisites and fents in which American competition is now very active, do not need any detailed discussion. They contribute at present about 3 per cent. of the total British import trade with India. Even if America succeeds in capturing the entire trade in these products from the United Kingdom which, however, is unlikely, the total British trade with India will hardly be affected.

But there are indications that in a more distant future America may prove a serious competitor of Britain not in the minor items of trade which now attract so much attention but in the more important products like iron and steel and cotton goods, which constitute at present about 51 per cent. of the British exports to India. At present American competition in these goods in the Indian market is insignificant.

But the U.S.A. is the only country in the world which has now a cotton industry comparable in size with that of the United Kingdom. In 1926, the former had 32.2 per cent. as against 33.3 per cent. of the world's cotton looms in the latter.<sup>1</sup> It is true that the greater part of American cotton goods is consumed in the domestic market and only a small surplus is available for export. But the mass production of cotton goods is only in its infancy in America. It appears from a recent article in the *Statist* that "it is only now that American cotton manufacturers are turning their attention to the export trade, owing to an increasing output due to the erection of more spindles and the greater frequency of double shifts".<sup>2</sup>

England still maintains her superiority in high grade cotton goods in which she finds a market even in the U.S.A., but in the cheaper standardised products, America is a formidable competitor of Britain in Canada, Mexico and South America. American cotton goods have already displaced British stuffs to some extent even in South Africa. She has gained also a small footing in Australia and New Zealand. One will not be surprised if she turns in future her attention to the piecegoods market in India.

The position of the British iron and steel industry is weaker than that of America. England's supremacy in this industry during the last century was mainly based on the abundance of coal and iron in close proximity. But, with the working of deeper mines, the cost of production of coal is

<sup>1</sup> Balfour Committee's *Survey of Textile Industries* (1928), p. 65.

<sup>2</sup> *The Statist* dated Dec. 1, 1928, p. 1018.

steadily rising in Britain and she is already dependent on foreign countries for more than one-third of her supply of iron ore.<sup>1</sup> It is true that the American iron and steel industry is at present mainly concerned with its home market and its competition in the foreign market, with the exception of Canada, is of a limited character. But the Balfour Committee on Industry and Trade rightly observe, "the extent of American resources in coal and iron ore, and the rapidity with which the industry is expanding to meet domestic demands, make the United States a factor of great potential importance in the world's market for iron and steel".<sup>2</sup>

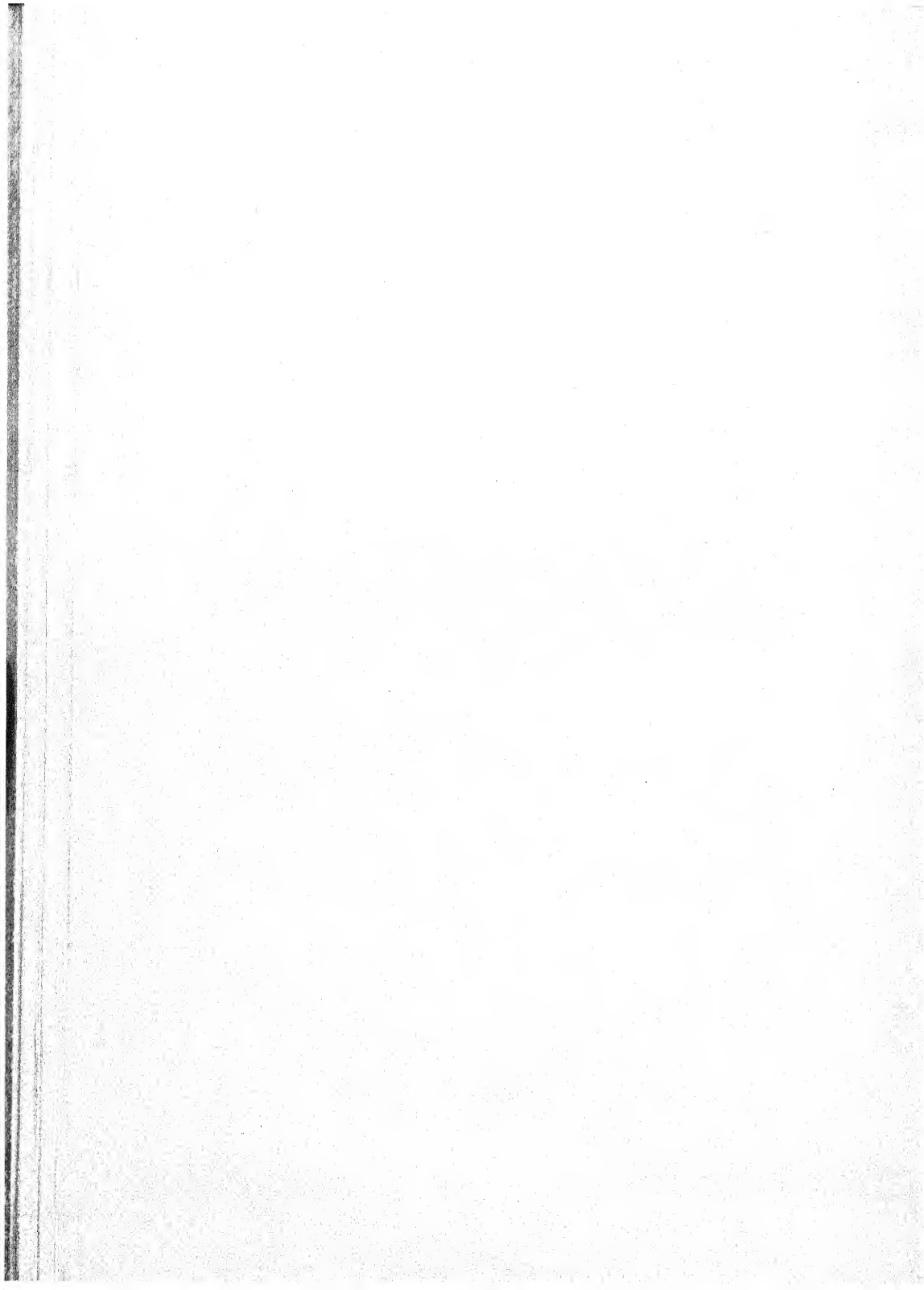
The present tendency of American trade indicates also the possibility of her future competition in iron, steel, and cotton goods. Direct trade between India and America has increased since the outbreak of the Great War, but a substantial part of the trade between the two countries is even now triangular. As is well known, Indian exports to America considerably exceed the imports in value. A part of this favourable balance is liquidated by the shipment of American raw materials and foodstuffs to Britain which sends her own manufactures to India. These create the credits with which a part of the excess of Indian exports to America is paid. As the U.S.A. becomes more and more industrialised, she may pay for the excess of Indian exports, not by sending raw materials to Britain, but with the direct shipment of American manufactures to India. For this, not automobiles and typewriters and such other commodities, the demand for which must necessarily be limited in a poor country like India, but cheaper grade cotton goods and iron and steel products will be the most suitable imports.

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<sup>1</sup> The output of iron ore in the United Kingdom and the amount imported in recent years are tabulated below from certain figures in the *Survey of Metal Industries*, p. 117 :—

|      |    | Output of U. K.<br>(in thousands of tons). | Import of iron ore<br>(in thousands of tons). |
|------|----|--------------------------------------------|-----------------------------------------------|
| 1913 | .. | 15,997                                     | 8,028                                         |
| 1924 | .. | 11,051                                     | 6,187                                         |
| 1925 | .. | 10,143                                     | 4,588                                         |

<sup>2</sup> *Survey of Metal Industries*, p. 89.



## Some Geographical Observations in Western Tibet.

By S. R. KASHYAP.

The present paper describes some of the more important observations connected with the geography of Western Tibet, which are either new, or amplify, or correct the observations of previous travellers. I visited the country first in 1922, and then a small portion of it in 1923, and then again quite a large portion in 1926. The observations recorded in this paper relate to the first and the last journey only. I would like to say that these journeys were not undertaken for geographical exploration, nor did I take any equipment for this purpose with me. The observations were made only incidentally and the equipment consisted of a photographic camera, a compass, a measuring tape and a hypsometer with a few thermometers.

In 1922, I had four professors of the Khalsa College, Amritsar, with me, *i.e.*, Professors B. R. Chatterji, Kashmira Singh, Charan Singh and Harkishen Singh. In 1926, I travelled alone, with two servants.

By Western Tibet we understand the country to the north of the Himalayas, situated along the Sutlej, the Indus, and their tributaries, extending from the watershed between the Sutlej and the Brahmaputra westwards to Kunawar in Bashahr State. This paper relates only to the upper Sutlej valley and does not include the Indus valley. This country is exceedingly interesting in many ways. It is situated at a very high altitude, and some of the portions are amongst the highest inhabited parts of the world. The climate is exceedingly rigorous, being very dry and cold, and is characterised by very strong dry cold winds. On account of the very high wall of the Himalayas the monsoon does not penetrate into the interior, and consequently there is very little rain-fall. Even in winter the snow-fall is not much, but the temperature falls very low, and the dry cold is intense. As a consequence of this the fauna and the flora are represented by very few species; the species present, however, are characterised by very interesting features.

The country is also interesting on account of the sanctity in which it is held by the Hindus and the Buddhists all over Asia because of the holy lake, Manasarovar, and the famous mountain, Kailas, which are held sacred by the followers of both religions.

The third reason which makes the country very important lies in its hydrographical characters. Round about the Mana-

sarovar lake lie the sources of four great rivers: the Indus to the north, the Brahmaputra to the east, the Karnali to the south, and the Sutlej on the west.

On account of all these important features the country has had a great fascination for travellers; but the difficulties of travel are so great on account of the rigorous climate, desert nature of the country, lack of provisions and even fuel, that very few foreigners have been able to penetrate into it. Even the people of the higher Himalayas who go there to trade with the Tibetans at the few trade marts, do so only during the short summer, as the passes are closed during the rest of the year, and therefore the trade marts are also deserted except for the short period of two months or so and in some cases even less.

Sven Hedin in his "Southern Tibet" has given a very comprehensive account of the history of travel in this region, and so great is the importance of this region that out of four volumes of his work dealing with this subject more than 2 deal with the Manasarovar region. Father Desideri is said to be the first European to see and describe the Kailas in 1715. Moorcroft visited Manasarovar in 1812, Strachey travelled in this part in 1846, Rawling and Rider passed through this region in 1905 on their way from Lhasa to Simla, Sven Hedin spent a good deal of his time here between 1905-07, and Sherring paid a short visit to the country in 1907. These are the chief travellers who have left records of their journeys.

In 1922, I entered the country from Bians *via* the Lipulekh Pass, 16,780 ft., which I crossed on the 19th July; thence I went to the trade mart at Takla Kot, thence to the holy lakes Rakastal and Manasarovar, then a little to the north to the Kailas, and after going round it went westwards to the trade mart at Gyanima, thence to the famous monastery at Tholing which is the biggest monastery in Western Tibet, and then re-crossed the Himalayas by the Mana Pass, 17,890 ft., on the 23rd August, reaching Badri Nath, the well-known place of pilgrimage in Garhwal. Thus I spent five weeks in the country and travelled about 250 miles from east to west.

In 1926, I entered Tibet again by the same pass but this time passing through the Darma Valley. I entered Darma a little above Dharchula, went up the Darma Ganga and crossed into the Kali Valley by the Joling Kang Pass, which is exceedingly steep on the Darma side and is one of the most difficult passes that I have crossed. I crossed the Lipu Lekh Pass on the 10th July. After this, passing through Takla Kot, visiting the two lakes and circumambulating the Kailas, I visited the very unfrequented monasteries of Dolchu and Tirthapuri and reached Gyanima. From here I re-crossed the Himalayas into Johar (Almora District) by the three passes Kungri Bingri, Jayanti, and Unta Dhura. The three passes have to be crossed

in one day and this was done on the 6th August. Thus I spent nearly 4 weeks in that country.<sup>1</sup>

After these introductory remarks I take up some of the more important observations made during these two journeys. The observations fall into 4 groups, namely:—

1. The source of the Sutlej and the channel between the Manasarovar and the Rakastal lakes.
2. The circumambulation of the Kailas with special reference to the Dama La and Gauri Kund lake.
3. The hot springs at Tirthapuri.
4. The three passes to Johar.

#### 1. THE SOURCE OF THE SUTLEJ AND THE CHANNEL BETWEEN THE MANASAROVAR AND THE RAKASTAL LAKES.

As is well known these two lakes are situated side by side at an altitude of about 15,000 ft., the eastern one being known as Manasarovar or Mabang in Tibetan and the western Rakastal or Lagang in Tibetan. For a long time, there has been a great controversy about the channel connecting these two lakes but it is now generally accepted that a channel does exist between the two lakes though it has been occasionally denied. The only question of importance is whether the channel contains water at fairly frequent intervals or not. Sven Hedin has given all the historical information available up to 1913, in his "Southern Tibet." Strachey who visited the place in October 1846 states that he came upon a "large stream 100 feet wide and 3 feet deep, running rapidly from east to west, through a well defined channel. This was the outlet of Manasarovar". Rider visited the same part in 1905 and says:—"Skirting the lakes we rode across the low hills, which close in on the western side, to look for the outlet, which Moorcraft had not been able to find, which Strachey had found, and Mr. Savage Landor had claimed to have discovered did not exist. We struck the channel a mile below the outlet, a small stream only partly frozen over, this we followed up and found that it did not flow from the lake but from a hot-spring, at which we found and shot some Mallards. We then followed a dry Nullah to the lakes and proved that Strachey was, as was to be expected, quite correct. No water was flowing at this time of the year, but the local Tibetans all agree that for some months in each year there was a flow during the rainy season and the melting of the snows, i.e., about from June to September. As a rise of about two feet in the level of the lake would cause water to flow down the channel this appears quite worthy of the belief. The length of the

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<sup>1</sup> Mr. H. Rutledge, I.C.S., then Deputy Commissioner of Almora, was on an official visit in Western Tibet this year and we travelled together for many days.



channel between the two lakes is about three miles". Rawling did not visit the lake, nor did he pass along the bridge between the two lakes.

The fact is that the Manasarovar lake, more or less oval in outline, is surrounded on all sides by mountains, except for a gap at its north-west corner. The ridge between the two lakes is not very high. At the place where the gap begins there is a monastery (Jiu monastery) perched on a cliff on the northern side of the gap, the ground consists of gravel, and water could certainly flow from the Manasarovar lake to the Rakastal lake through this gap. In 1922, on the 28th July travelling from Gossul-Gompa along the bank of the Manasarovar lake for a few miles and then turning to the left I crossed this channel at some distance from Manasarovar, where there are some hot-springs forming a small stream flowing west. Our party crossed this stream by a small bridge, but there was no water coming from the Manasarovar. In 1926, I camped on the bank of Rakastal on the 17th July. Next day I crossed the intervening ridge to the Manasarovar, and camped on its bank near Gossul-Gompa. From this camp I went along the bank of the lake northwards and camped near the bank under the Jiu-Gompa, just at the beginning of the channel. The ground near the bank at this place consists of gravel as already stated, and scattered here and there from the bank of the lake along the bed of the channel were several small ponds. The first pond was at a distance of 50 feet from the margin of the lake. The water at the north-west corner was shallow for a long distance along the bank (more than a mile) and far into the interior of the lake. The ground separating the nearest pool from the lake was not more than 6 inches above the water and it was clear that a rise of about 6 inches in the level of the lake would make the water flow into this pond and then to the next, and so on a continuous stream would be formed. At this corner the gravel formed a plain about  $1\frac{1}{2}$  miles long along the bank and bounded by low hills which converged to the channel between the Jiu-Gompa and the opposite hill. The distance between the bank of the lake and the foot of the gompa hill is a little more than half a mile. Next day I travelled for a long distance along a path more or less parallel to the channel and camped at Barkha. Sherring states that the channel is about 3 miles. Sven Hedin makes it 6 miles. So far as I could judge the channel is about 3 miles long.

Meteorological observations on the bank of Manasarovar near Gossul-Gompa were as follows:—

Time: 7-15 A.M., 19th July, 1926, weather calm and clear.

|                           |    |          |
|---------------------------|----|----------|
| Air temperature           | .. | 9°·5 C.  |
| Temperature of lake water | .. | 8°·9 C.  |
| Boiling point             | .. | 85°·0 C. |

So far my own observations. I was, however, told by very reliable people, Bhotias (Bians people), whom I had known for some years and who had been in Tibet in 1924-25 that the channel contained water flowing from the Manasarovar to the Rakastal in both these years. A lady, well-known, both in Bians and Johar and who had been to the Manasarovar lake no less than seven times told me that in 1924 she had actually crossed that stream on a yak along with other people and that the flow was so swift that she was afraid of being washed away and that the water came up to the abdomen of the yak. Similarly, my guide in 1926—a man from Gunji (Bians)—told me that he had crossed the stream in 1925. I am in a position to add to these statements still more recent information. Last summer (1928) a professor from a Lahore College went to Western Tibet, visited Manasarovar, went round the Kailas and followed my route of 1922. He tells me that in the middle of August 1928, he crossed the channel between the two lakes in which a stream about three feet deep was flowing. The name of the gentleman is D. P. Rai, and he formerly belonged to the Dev Samaj College.

It is clear, therefore, that whatever the conditions may have been formerly, there has been a connection between the lakes during recent years, *i.e.*, 1924, 1925, 1928, and that in 1926 a rise of six inches in the level of the lake would have made the water flow in the channel. Sir Sydney Burrard, considering the evidence available up to 1907, decided that year to include the lake basin of Manasarovar in the catchment area of the Sutlej. The evidence available since that date, as stated above, certainly confirms his conclusions.

There is no evidence whatsoever that any water has flown out of the Rakastal for a very long time. It is probable, however, that there is an underground flow of water from the eastern to the western lake and from the latter into the source stream of the Sutlej. The amount of the water flowing into the Manasarovar from the Gurla Mandhata and the other surrounding mountains is considerable, and as there is no outlet from the Manasarovar in some years, it is difficult to believe that evaporation alone can account for the loss of an equal quantity of water. There must be some underground flow, and this belief is confirmed by the presence of stagnant water in the channel itself. Some miles to the west of Rakastal at Lalingta I found a very small stream of water flowing westward, broadening into a fairly large pond at this place, but after some distance ultimately disappearing into the soil. In 1926, again there was no flowing stream along this channel above Dolchu which is about 20 miles from the foot of the Kailas. I was repeatedly told by the people that between Rakastal and Dolchu flowing water appears and disappears repeatedly. At Dolchu itself the Sutlej is quite a regular stream, which flows on uninterrupted further on. This would indicate that there is an

underground flow from the Rakastal. In 1926, I crossed this stream at Dolchu where it was 5 to 10 feet wide and 1 to 1½ feet deep. There is a very small spring just under the monastery here and I was told that a much bigger spring a little higher up is the main permanently visible source of the stream.

## 2. CIRCUMAMBULATION OF THE KAILAS.

Going round the Kailas is considered an act of great merit and of course all pilgrims go round bare-footed. The circuit takes about 2½ days and I have come across people who had done this circuit 10 times. There was one man from Lhasa, who was staying at Darchin, at the foot of the mountain, to complete full 12 rounds, which would take about one month. I have done the round only twice. Some *sadhus* and devout people measure the length with their body, lying prostrate, and as the path is very rough and stony it is an exceedingly, austere performance. The Kailas peak is conical, 21,600 ft. high, covered in its upper portion with perpetual snow, and has absolutely vertical walls in the lower parts. The peak is not actually on the long range of mountains known as the Kailas range, but is situated a little to the south of the range with which it is joined by a high ridge about 18,600 ft in altitude at the lowest place. This ridge has to be crossed in going round the mountain. Sherring thinks that the circuit is about 25 miles but he did not actually go round the mountain; Sven Hedin makes it about 30. My own estimate is 29 miles. During the circuit one meets with four monasteries on the four sides of the mountain. The circuit begins from the south side at a place called Darchin, though the actual first monastery is situated higher up in the interior and rather less than a mile above Darchin. It is very seldom visited by pilgrims, and Sven Hedin himself, who gives a very detailed account of the whole circuit around the mountain, says that he did not visit it. This monastery is called Kiangda (also spelt by different people as Gyangta). I visited this monastery on the 24th July, 1926. Unlike the other monasteries which are built in the side of the mountain it is situated on an eminence and has a commanding position. It is a solid, substantial, square building and undoubtedly the finest and the best furnished of the four monasteries. The monastery has some old armour, helmets and swords, in addition to the usual paraphernalia. The circuit of the mountain is usually done in a clock-wise manner. From Darchin the next monastery, the Nyandiphu, is four miles. After going north-west for the first two miles the road turns to the north. This second Gompa is perched along the vertical side of the rock and has two big elephant tusks inside. It is situated in a very perilous position as there is a danger of the rocks falling from above. I was told that some years before a big rock did

actually fall down and destroy a part of the building. Just before the Gompa there is a gateway and a little beyond this two small wooden bridges on the stream coming from the north are crossed to reach the Gompa. From here the road runs on both sides of the stream. The road up to this monastery is on good firm ground, but further on it becomes stony. The valley is fairly open, but the rocks on both sides are steep and vertical, of a sepia colour, and there are small water-falls coming down from them. The rocks have fantastic shapes, resembling forts, battlements, etc. From Nyandiphu-Gompa the road runs straight north for about 5 miles, then it crosses two branches of the stream coming from the north, from the Dungdung pass beyond which is the country watered by the Indus. Both the streams had to be forded, though the second had a small bridge formerly; this was, however, broken at the time, though there was another bridge higher up. The Kailas peak had been visible up to the Nyandiphu-Gompa, after which it was mostly hidden and only occasionally visible. Its western face had a lot of snow. A cornice at the top could be seen projecting like the edge of an umbrella. After crossing the stream the road turns to the east, and the Didiphu-Gompa is a little more than a mile from here. I was now north of Kailas. The north face of the Kailas is extremely steep, with very little snow and formed of a vertical black rock. I camped just below the Gompa. Here there is a huge piece of rock with the Tibetan prayer, "Om mani padme hum" engraved on the surface. The ground at this place forms a rectangle with more or less parallel sides. On the west the straight wall has at its base the stream mentioned above coming from Dungdung and which I had crossed just before reaching this Gompa and which joins the stream running along the base of the Kailas first westwards and then southwards. On the east, one sees a similar wall again with a stream coming from the north and joining the Kailas stream. At the back on the north there is another straight wall with the Gompa in front. On the south there is the Kailas with its snow-covered top and black surface below, with patches and lines of snow. In front of this cone to the north on each side there is a smaller bare conical hill. The west one ends at the stream up which I had travelled and a small stream flows between the Kailas and this conical hill. Another stream flows on the east side of the eastern cone. Beyond this last stream there is another elongated (north-south), rather truncated hill with one more similar but much more elongated (north-south) and snow-covered hill lying still further with streams on both sides. The eastern wall of the rectangle as seen from the monastery appears to end near the last but one southern ridge mentioned above; the last southern ridge is a little beyond this and is not visible from the monastery. All these streams from between these gorges unite and flow in front of the camp in a fairly

broad stream. In going to the next stage one has to cross the stream coming from the north and then go up the small stream to the east of the last ridge. At the Didiphu-Gompa camp on the 23rd July, 1926, the meteorological observations were as follows :—

|                    |    |    |                 |
|--------------------|----|----|-----------------|
| Time ..            | .. | .. | 8 A.M.          |
| Air temperature .. | .. | .. | 7°.2 C.         |
| Boiling point ..   | .. | .. | 83°.6 C.        |
| Weather ..         | .. | .. | Calm and clear. |

In 1922 when I camped at this place on the 30th July we had a fairly heavy fall of snow at night and hail and rain for part of the journey next morning. During a large part of the journey that year it had been cloudy and rainy, and although I had a fine view of the Kailas at Barkha, a few miles before Darchin, I never had a glimpse of the mountain after that because either I was too near it or it was hidden by clouds. In 1926 except for a few drops of rain and some small hail-stones near the Nyandiphu-Gompa it was perfectly clear up to Gyanima.

From Didiphu the next stage, the Zuntu monastery (called Zutulphu also), is about 13 miles over the Dama La (written by some as Dolma La), which is on the ridge that joins the Kailas peak to the Kailas range. The height of this pass is given as 18,599 ft. Of this stage Sven Hedin gives a full description as usual, but since his observations do not coincide with mine I will quote at some length from him. "Southern Tibet" Vol. IV, p. 373, has the following, "Sherring gives a short description of the pilgrimage around the Kailas, but it does not appear from his narrative whether his communications are derived from his own observations or from the native informants. Nor does his map say anything as to his own route, for it has all the trade routes marked in red. Concerning the road from Tarchen (or Tarchan) and back to Tarchen, he says, the circuit is about 25 miles, *i.e.*, 40.2 km. In reality it is 48.4. His description is interesting as it was probably the single one existing before my journey. He says ("Western Tibet" p. 297 *et seq.*) 'The actual circuit round the holy mountain of Kailas—occupies on an average 3 days, the distance being about 25 miles. The path is not good, walking is absolutely obligatory, and the track rises in one place to a very great height, namely, to the Gauri Kund, which is a lake that remains frozen at all times of the year, even in the hottest weather...ordinarily the first monastery visited is the one at Nendiphu (Nyandiphu)...The next monastery is at Didiphu (Diripu), and thence the road goes *via* the Gauri Kund frozen lake to Zutulphu (or Jamdulphu), (*i.e.*, Tsumtulpu)...Darchan is the spot where the circuit begins and ends.' The description is fairly correct. 'The very great height' is not at Gauri Kund but at the pass, Dolmala, 4 km. west of the lake. A

European who had made a journey would never have omitted to mention the pass which is by far the most striking experience the whole way around the Kailas”.

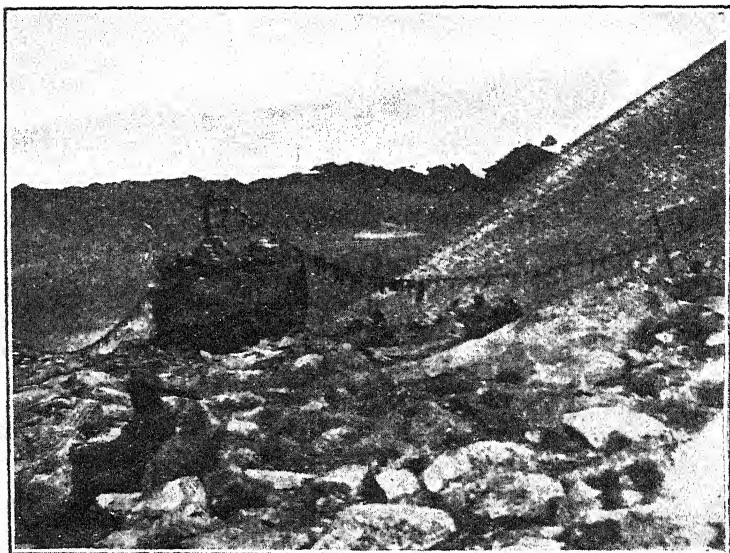
On page 375 we have:—“A moment later we reached the Didigompa with a gigantic block in front of it and the holy formula engraved on the surface of the latter. Here...the altitude is 5,091 m. The blocks lying about everywhere in the region consist of granite (quartzbiotite-biorite). The next day’s march on September 4, took us 17.5 km. S.E., E.S.E., S.E., and finally, S.S.W., around the northern parts of the Kailas massif. From Diripu-Gompa we had 1.3 km. S.E. to the pass Dolmala, one of the highest we had to cross on the whole journey in Tibet, being 5,669 m. high or 578 m. above camp. The rise is, therefore, if taken on a direct line, enormous, or as 1 : 2.25, which was the sharpest gradient I ever had. One had to ascend one m. for every  $2\frac{1}{4}$  m. of road. As such a slope is too hard for riding animals, one has to take the ascent of the pass in zigzags. On the southern side of the pass we had 16.2 km. to camp CCXXXII, Tsumtul-pu-Gompa where the altitude is 4,863 m. being a descent of 806 m. and a fall of 1 : 20.1”. In “Trans-Himalaya,” Vol. II, p. 201–202, no details of the distance of the journey round the Kailas are given. He simply states “From the pass we descended among boulders to the tiny round lake Tso-kavala”. “IN MY LIFE AS AN EXPLORER” page 425 (1926), he states, “From Dolmala our road ran steeply to the pool of Tso-kavala, which is always frozen over”. In “Southern Tibet,” Vol. IV, p. 413, he gives the altitude and the distances and among them are the following:—

| Place.         | Distance<br>from last<br>stage. | Altitude. | Rise or fall<br>in metres. | Rate.     |
|----------------|---------------------------------|-----------|----------------------------|-----------|
| Diriphu-Gompa. | ..                              | 5,091     |                            |           |
| Dolmala.       | 1.3 km.                         | 5,669     | Rise of 578                | 1 : 2.25. |
| Tsumtul-Gompa. | 16.2 km.                        | 4,863     | Fall of 806                | 1 : 20.1. |

It appears also that he had no intention of giving a description of the circuit of the Kailas, when he began writing his “Southern Tibet”. It was an after-thought. In the preface (Vol. I, p. XII) he says, “My own journey has been described as succinctly as possible with indications only of its chief characteristic traits. Certain parts have not been mentioned at all. Thus, for instance, I have altogether omitted the voyage round the Kailas for the reason that I had given quite a sufficient account of its features already in my popular work “Trans-Himalaya.” Yet we find in Vol. IV, p. 371, the chapter entitled, “THE PILGRIMS ROAD ROUND THE KAILAS”, containing a detailed description.

Starting from the Didiphu-Gompa the road crosses the stream from the north by a bridge, after which there is a rather

steep ascent for about a mile to the east. After this there is about a mile of more or less level road in the same direction, then comes a mile of gentle ascent to the north-east, and then about a mile and a half of rather stiff ascent,—rather steep in the beginning but nowhere very steep—to the Dama La. The road always keeps on the right bank of the stream and curves round the first long ridge visible from the Gompa. Vegetation begins to decrease, specially at the fourth mile. The road is not particularly bad though it is stony with big and small boulders and stones. There was dense grass forming a thick carpet along streams lower down. After the third mile when the road turns to the right, it crosses a very small stream, coming from the



Dama La, 18,599 ft.

north-east and passing mostly under the stones. At the top of the pass there is a huge stone with flag poles on each side connected by strings with the flag poles on the stone. From the strings hang small pieces of cloth and wool as usual on passes in Tibet. From this stone onwards the road is level for 175 ft., to the edge of the pass. Immediately below this is the frozen Gauri Kund Lake. From the edge of the pass to the edge of the lake along the bends of the zigzag road the distance is 600 ft.; in a straight line, of course, it is much shorter. Thus the distance from the Didi-Gompa to the Dama La is not 1.3 km. as Sven Hedin says but 4.5 miles and the distance from the pass to the Gauri Kund Lake is not 4 km. (more than



13,000 ft.) as he says but only 600 ft. from the edge of the pass or at most 775 ft. from the huge stone with the flag pole, and the rise is not 1 : 2.25 as stated by him but very much less, 1 : 12.5 or 1900 ft. in 4.5 miles. The observations on the top of the Dama La on Friday, the 23rd July, 1926, were as follows :—

|                 |    |    |                 |
|-----------------|----|----|-----------------|
| Time            | .. | .. | 12.15 P.M.      |
| Air temperature | .. | .. | 17°.6 C.        |
| Boiling point   | .. | .. | 81°.7 C.        |
| Weather         | .. | .. | Clear and calm. |

The lake appears oblong from the pass, but seen from the other places it is rather oval—broad towards the west end and narrower towards the east end; the sides not quite regular, but with a small bend here and there and a rather large projection near the eastern part of the south side. The lake runs along the ridge to its south, which extends north-west to south-east. The middle of the ridge is concave and is perfectly vertical with a hanging glacier on the top. In 1926, there was very little snow. The northern bank of the lake is formed by a big mass of large and small stones and the road runs along this. This side is also concave inwards. When this stony mass meets the southern ridge there it a depression at each end. It is impossible to reach the south side as snow and stones are constantly falling down. The lake is shallow on the northern side but deeper on the southern. There is also more snow on the south and only a thin layer on the north. In 1922, my bearer and another member of the party had a bath here after removing the snow layers at a height of about 18,500 ft. The length along the bank from N.W. corner to the S.E. corner was 2,212 ft. The other side, of course, could not be measured, but appeared to be approximately of the same length. If the lake is taken to be roughly oblong then the length from the N.W. corner of the cliff to a big boulder under which people take shelter is 1,600 ft., and breadth from this place to the S.E. corner of the cliff 612 ft., but this, of course, is not an accurate estimate as the shape is oval, very broad on the western side and very narrow on the eastern side. The perimeter of the lake would thus be 4,424 ft., or about  $\frac{4}{5}$  of a mile. Beyond the lake the hills were crumbling on all sides, and the road was very stony for 2 miles, descending eastwards. After about 2 miles of descent, the valley opens into another coming from the north, and we followed the stream coming from this valley to the south. Going up the stream, the road leads to the Indus valley after crossing the watershed. The road runs along both sides of the stream but we kept to the right bank. A little further down there was a natural bridge of big boulders over the stream with the water flowing below them. There was a thick grassy carpet along the stream. The Kailas peak is just visible only from one place which is about



a mile down the bend to the south. Afterwards this valley opens out into another running east and west and the road turns west down the united streams and the last Gompa is about a mile from this place. The road after the first descent of 2 miles is practically level throughout.

From Zuntu-Gompa to Darchin, it is about 6 miles by the direct road but we went northwards and crossed a ridge running north and south to the Kiangda-Gompa on the other side, which is about a mile above Darchin. At Darchin I found a fossiliferous stone full of small shells.

### 3. THE HOT SPRINGS AT TIRTHAPURI.

From Darchin a road leads directly to Gyanima passing by Lalingta where there are some springs probably connected subterraneously with the Rakastal and which I had visited in 1922. In 1926, however, I travelled westwards to the unfrequented Dolchu monastery, which is about 20 miles from Darchin. Starting from Darchin I camped at a place 5 miles off called Kalyab after fording the stream coming from the Kailas past the Nyandi-Gompa about 2 miles from Darchin, and other streams later on. Owing to very little snow the year before and no rain up to that time the vegetation was extremely scanty. The road crossed many ridges alternating with dry channels, some coming from the Kailas range and others simply from local eminences. At Dolchu there is a very small spring but I was told that there is a very large one at a short distance which is the chief permanent visible source of the Sutlej. The observations at Dolchu on 28th July, 1926, were as follows:—

|                                 |    |    |               |
|---------------------------------|----|----|---------------|
| Time ..                         | .. | .. | 8.30 A.M.     |
| Air temperature ..              | .. | .. | 10°.0 C.      |
| Boiling point ..                | .. | .. | 85°.1 C.      |
| Weather ..                      | .. | .. | Calm and dull |
| Temperature of the spring water |    |    | 2°.0 C.       |

From Dolchu to Tirthapuri is about 20 miles due north-west. The Sutlej is crossed at Dolchu to the left bank simply by jumping across. It flows through a narrow channel in a wide grassy bed. About 2 miles down it expands into a lake, about 4 furlongs, by 2 furlongs with a good deal of *Ranunculus aquatilis*, *Zannichellia palustris* and *Potamogeton pectinatis* in water and *R. cymbalariae* and *Polygonum* species on the margin. Just after this a stream joins the river from the north (right bank) by many branches over a stony bed. The bed becomes stony and a little later narrow. At 5 miles or so the road ascends slightly leaving the bank and passes over a broad stony dry plateau for 2½ miles or so. Then the bed again becomes grassy with a narrow channel and the road goes down to the bank. About a mile and half from here the river passes through a narrow gate or gorge form-

ed by a much contorted yellowish rock on either side and meets another stream from a wide valley just before the gate. The road now passes to the right bank and the river has to be forded and the stream which is quite large is also forded. This stream is about 9 miles from Dolchu. The channel of the river and its bed are very narrow from here to Tirthapuri. The road goes high up on the right bank of the river and crosses a series of 3 terraces one after the other, the first smaller, the second larger, and the third larger still, and after a few furlongs descends again to cross another fairly large stream coming from the north. Then it ascends along a series of terraces and crosses a plain about 5 miles long to Tirthapuri, gradually descending again to the river bank. About 2 miles before the Gompa is reached there is a circular pit on the road with numerous mounds formed by piles of stones all round the margin as well as in the cavity. It is said to be the play-ground of the gods, and my Tibetans sat down inside this for a short time to meditate. Shortly before reaching the Gompa a dry channel is crossed and another immediately before reaching the Gompa. The Sutlej beyond Tirthapuri spreads out into a wide branched stream. There are hot-springs just beyond the Gompa above the right bank. The first one has the water gushing out through a main hole and 3 subsidiary holes. A little further there is another main hole with a few smaller holes. The temperature of the 2 main springs was suprisingly constant. The following were the observations as regards the temperature of the springs :—

|                        |    |    |       |
|------------------------|----|----|-------|
| 7 P.M. 28th July, 1926 | .. | .. | 69°C. |
| 7 A.M. 29th July, 1926 | .. | .. | 69°C. |

Temperature reading after the bulb of the thermometer was pushed deep into the opening, 69°.5 C.<sup>1</sup>

The temperature of the subsidiary holes was as follows on the same days :—

|                |    |    |                   |
|----------------|----|----|-------------------|
| In the evening | .. | .. | 67°.8 to 68°.8 C. |
| In the morning | .. | .. | 67°.0 to 68°.0 C. |

The observations at Tirthapuri were as follows :—

|                        |    |              |
|------------------------|----|--------------|
| Time : 29th July, 1926 | .. | 7.30 A.M.    |
| Air temperature        | .. | 9°.2 C.      |
| Boiling point          | .. | 85°.3 C.     |
| Weather                | .. | Calm, clear. |

There is a good deal of lime deposit round the place and calcification is going on round ropes, twigs, etc., which happen to be in the neighbourhood. There is also a great deal of lime deposit

<sup>1</sup> My large meteorological thermometer was broken while taking these observations.

at some distance above showing that the springs were in those places formerly. There is a tradition that the water came out from a place higher up above the monastery and this part of the hill is held sacred and the pilgrims circumambulate it while the monastery is not included in the circuit. There is a reservoir near the springs where the temperature is only 42°C. and where a bath can be taken by the devout pilgrims. So far as I know no traveller has given the temperature of these springs. Sven Hedin passed through Tirthapuri but he does not say anything about the temperature of the springs.

In going to Gyanima from Tirthapuri the Sutlej has to be forded at the latter place.

#### 4. THE THREE PASSES.

The passes were crossed on the 6th August, 1926. On the 5th we had camped on the side of a stream which was too strong to be forded in the afternoon. Next morning we forded the stream. The observations taken at this camp were as follows :—

|                 |    |    |           |
|-----------------|----|----|-----------|
| Time            | .. | .. | 6.30 P.M. |
| Air temperature | .. | .. | 13°C.     |
| Boiling point   | .. | .. | 84°C.     |
| Weather         | .. | .. | Clear.    |

From here to Dung across the passes is about 18 miles, and it is a long and rather trying stage. To the top of Kungri Bingri pass it is about 5 miles, then a very rough descent for a mile, then a gentle descent for a mile, after which there is an ascent of 3 miles to the top of Jayanti, when again a descent and ascent to the top of Unta, about 3 miles, from which Dung is about 5 miles descent. The figures for these passes as given by Sherring are :—

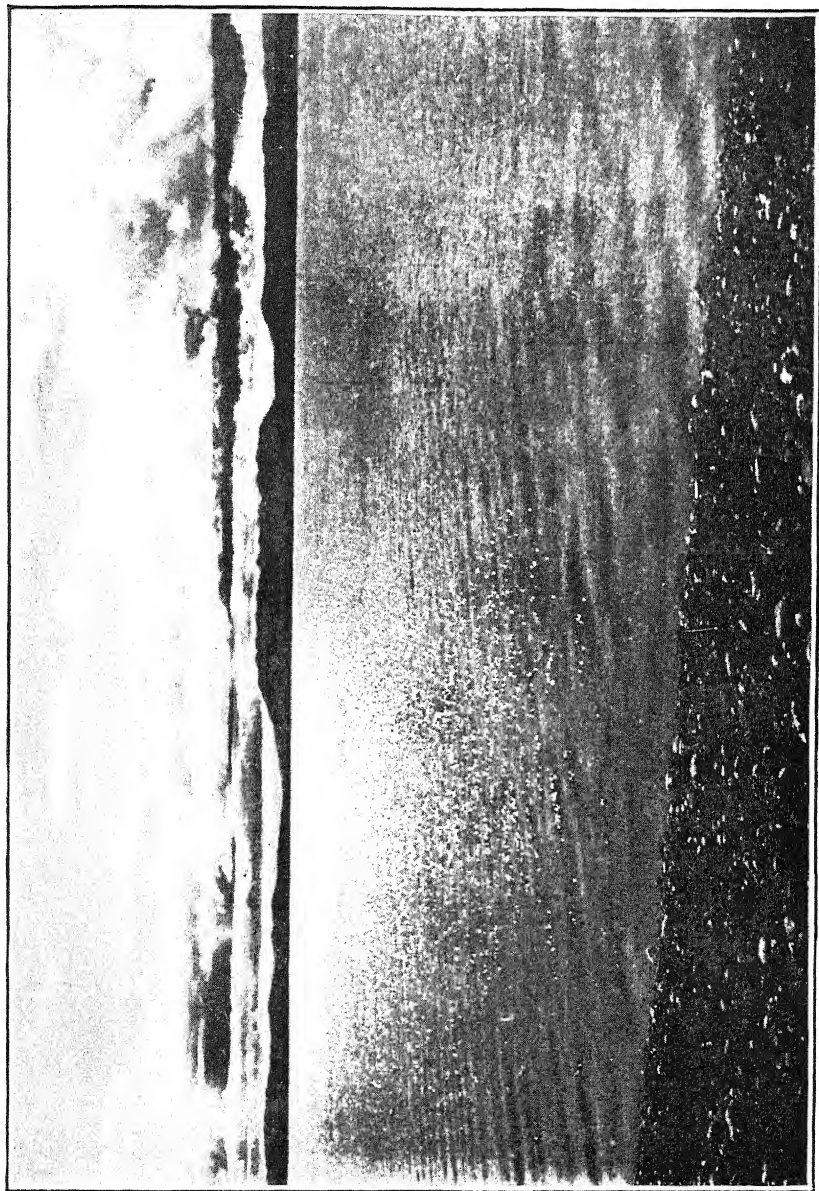
|                 |    |    |            |
|-----------------|----|----|------------|
| Kungri Bingri   | .. | .. | 18,300 ft. |
| Jayanti (Janti) | .. | .. | 17,000 ft. |
| Unta Dhura      | .. | .. | 17,590 ft. |

It was clear even without any hypsometric observations that the Jayanti pass is the highest and this conclusion was confirmed by the boiling point observations which are as follows :—

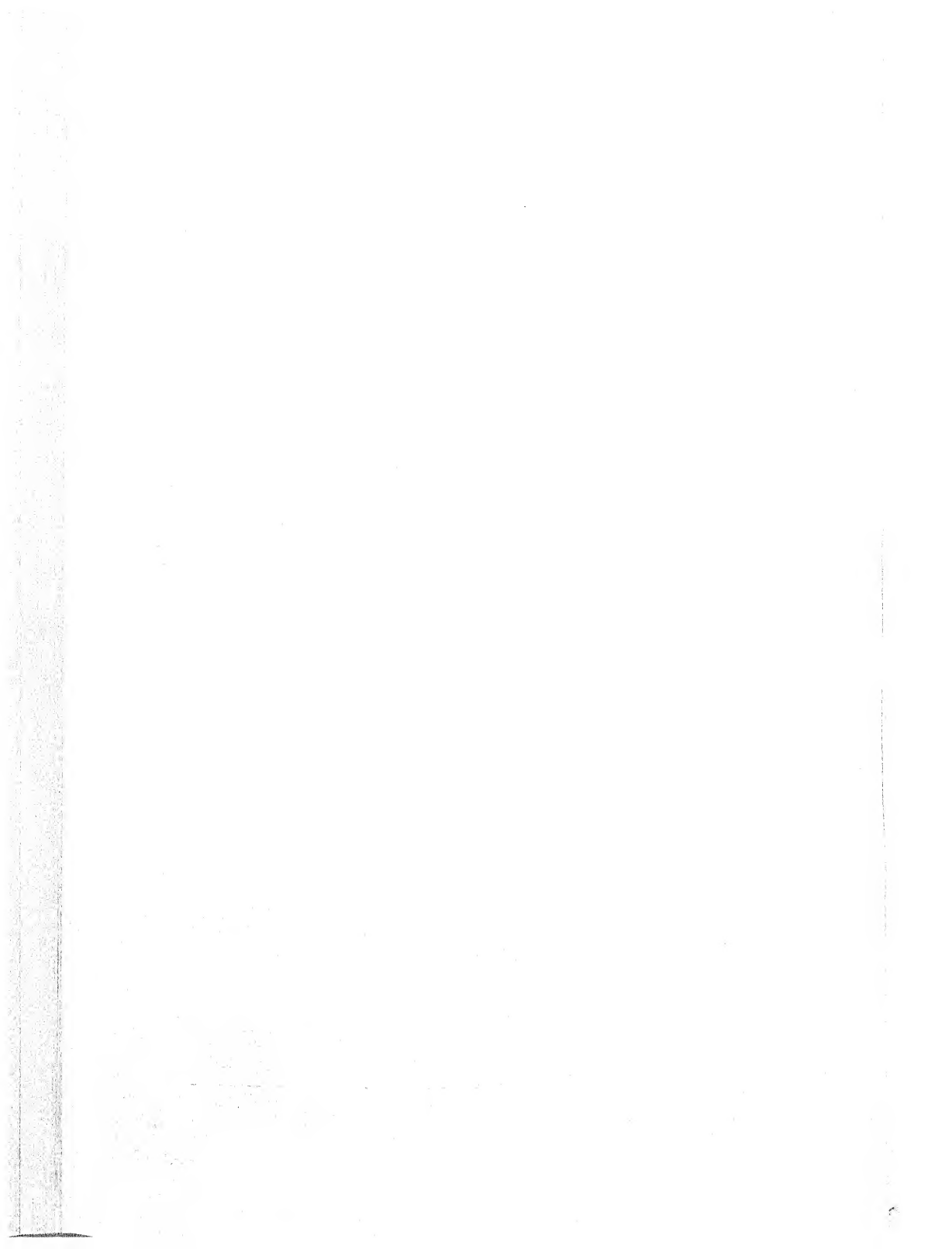
| Pass.         | Time.        | Air temperature. | Boiling point. |
|---------------|--------------|------------------|----------------|
| Kungri Bingri | .. 9.30 A.M. | 7° 0 C.          | 82° 0 C.       |
| Jayanti       | .. 1.00 P.M. | 16° 5 C.         | 81° 8 C.       |
| Unta Dhura    | .. 3.00 P.M. | 12° 0 C.         | 82° 8 C.       |

The weather was calm and clear throughout the day.

It would appear, therefore, that Jayanti is higher than the Kungri Bingri by about 200 ft.



Manasarover lake from Gossul-Gompa, Mayum la in the distance.



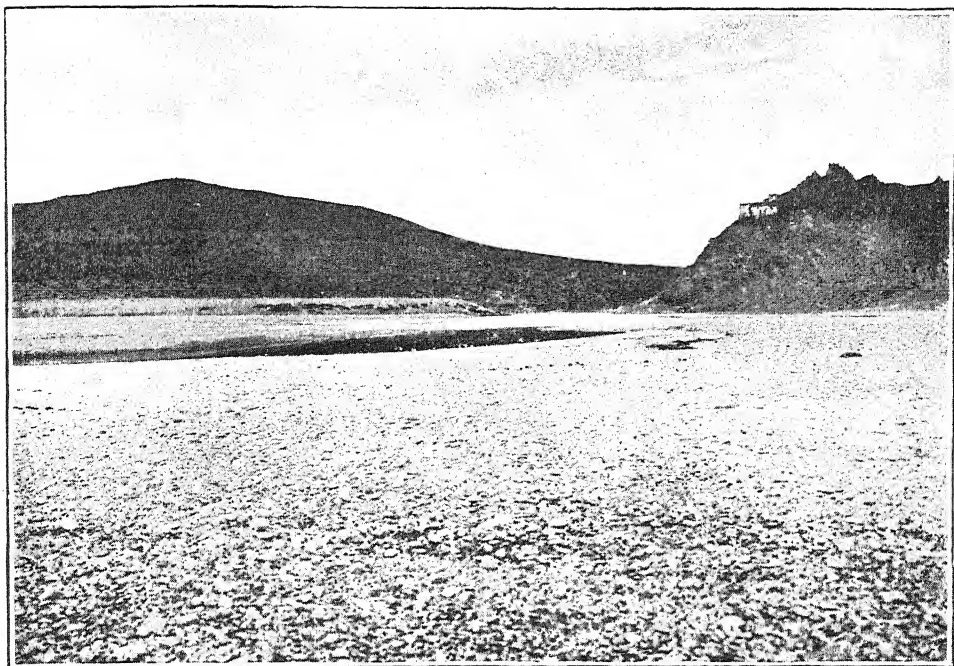


Fig. 1. Jiu-Gompa, Bank of Manasarovar. Note pond, and the channel between the two hills.

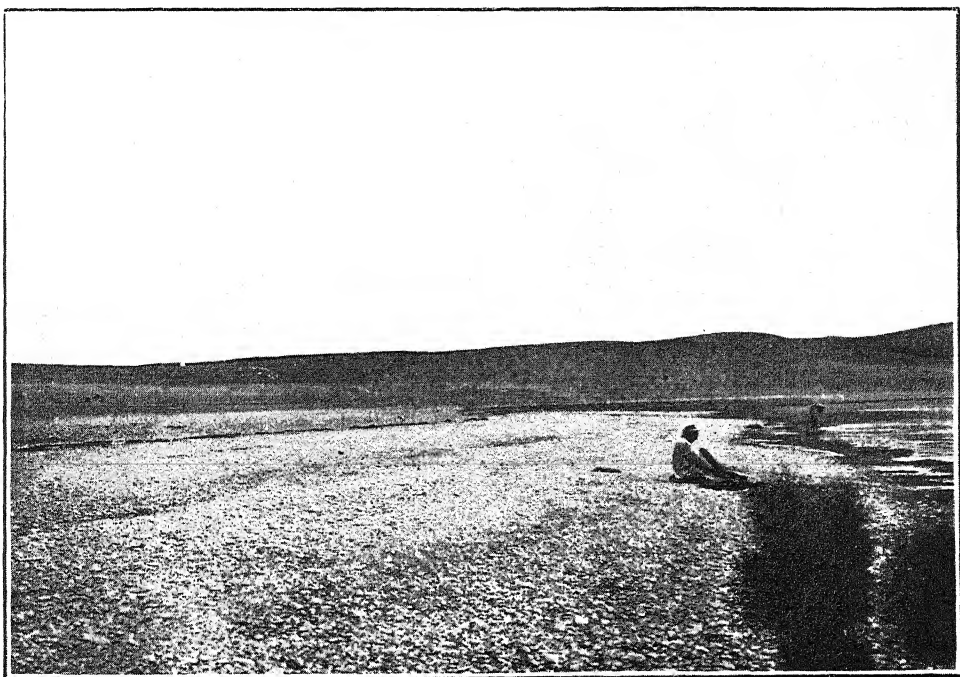
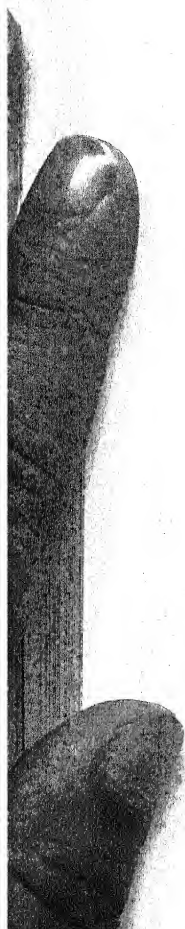


Fig. 2. The outlet of Manasarovar at the north-west corner.





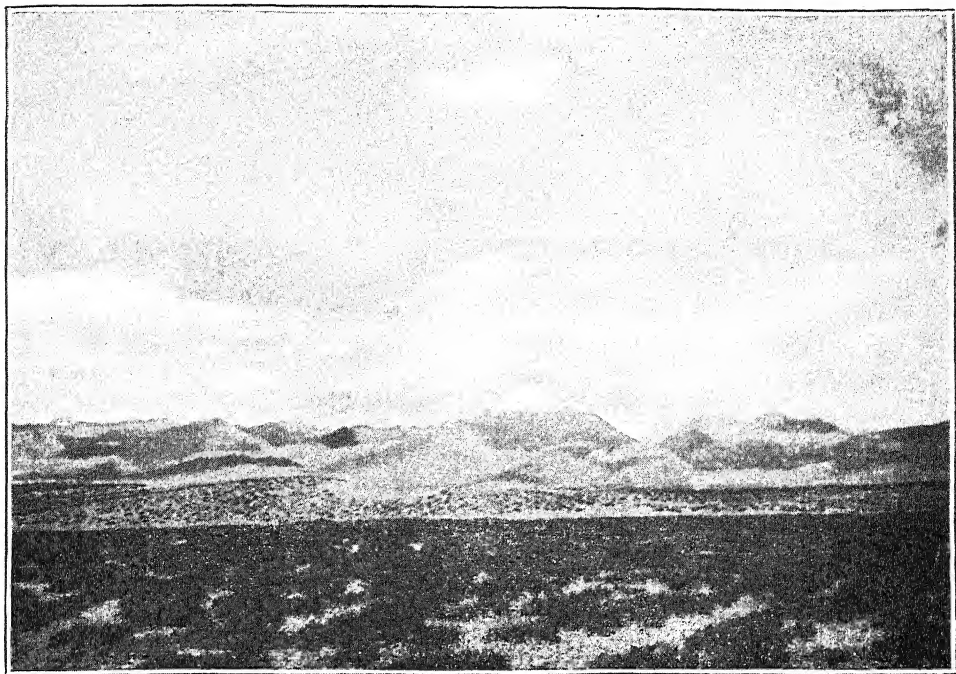


Fig. 1. The Kailas Range from the South near Rakastal, Kailas peak on the middle.

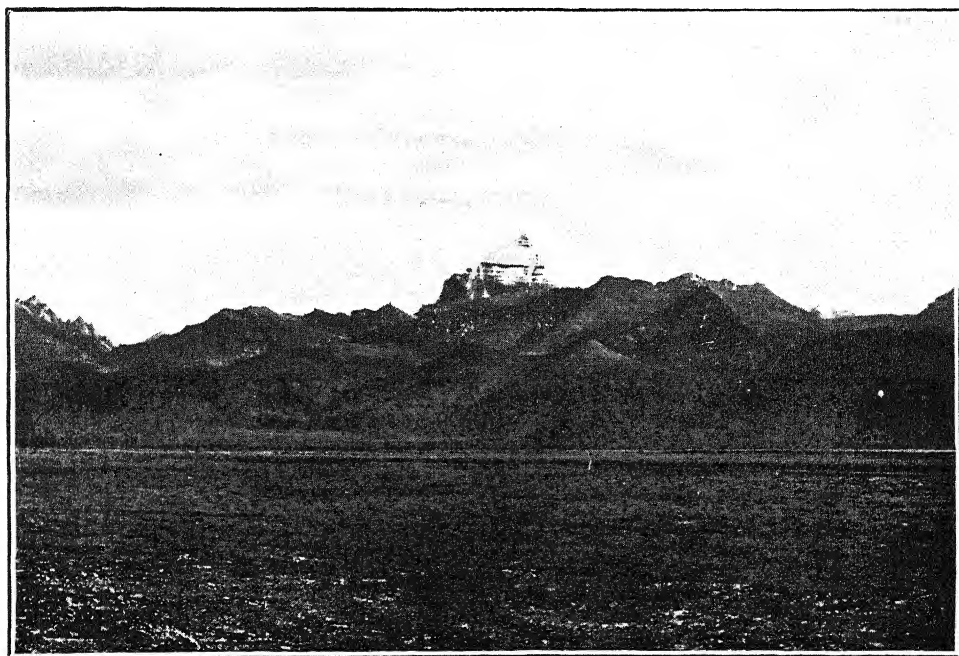


Fig. 2. The Kailas, 21,800 ft., from Barkha.





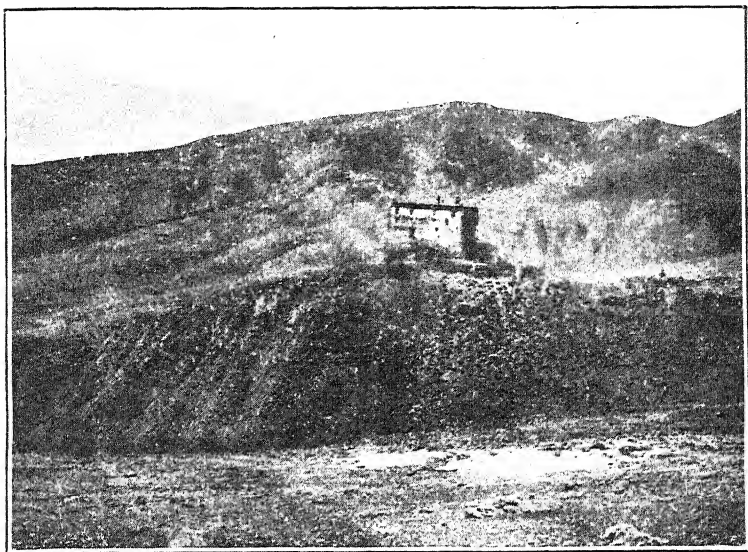


Fig. 1. First Monastery in Kailas round, above Darchin.

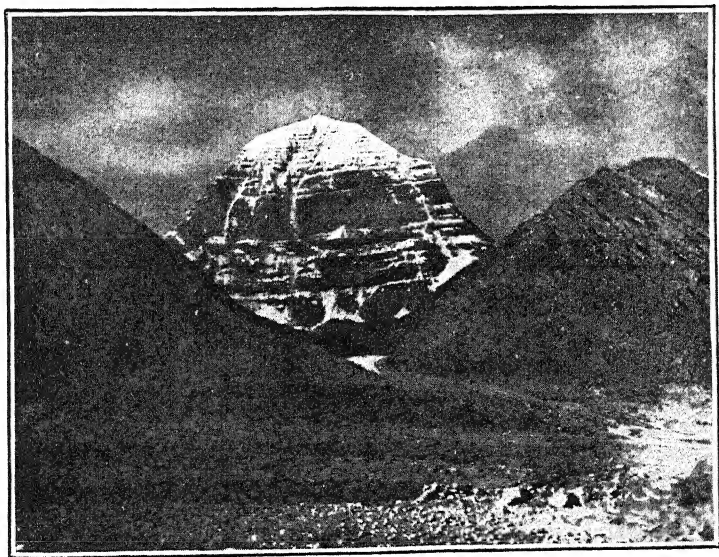
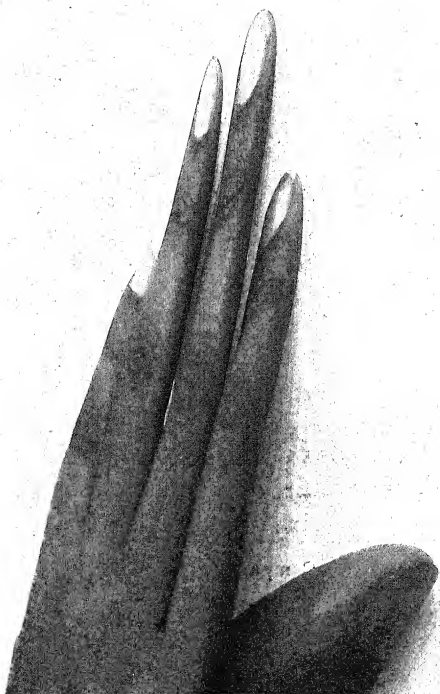


Fig. 2. Kailas from Didiphu-Gompa. North aspect.



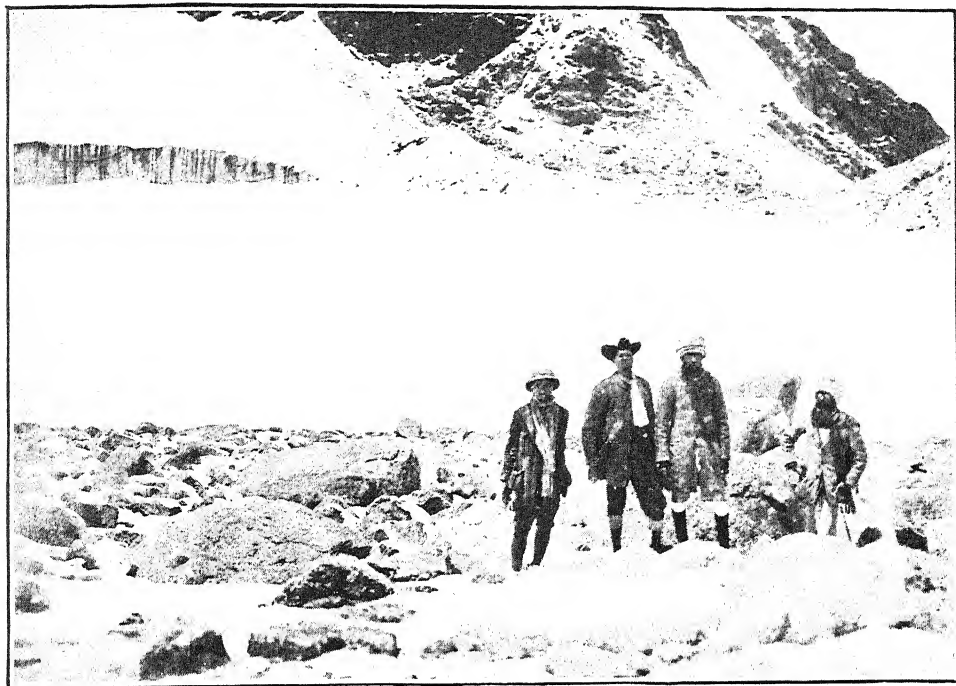


Fig. 1. Gauri Kund, 18,500 ft.

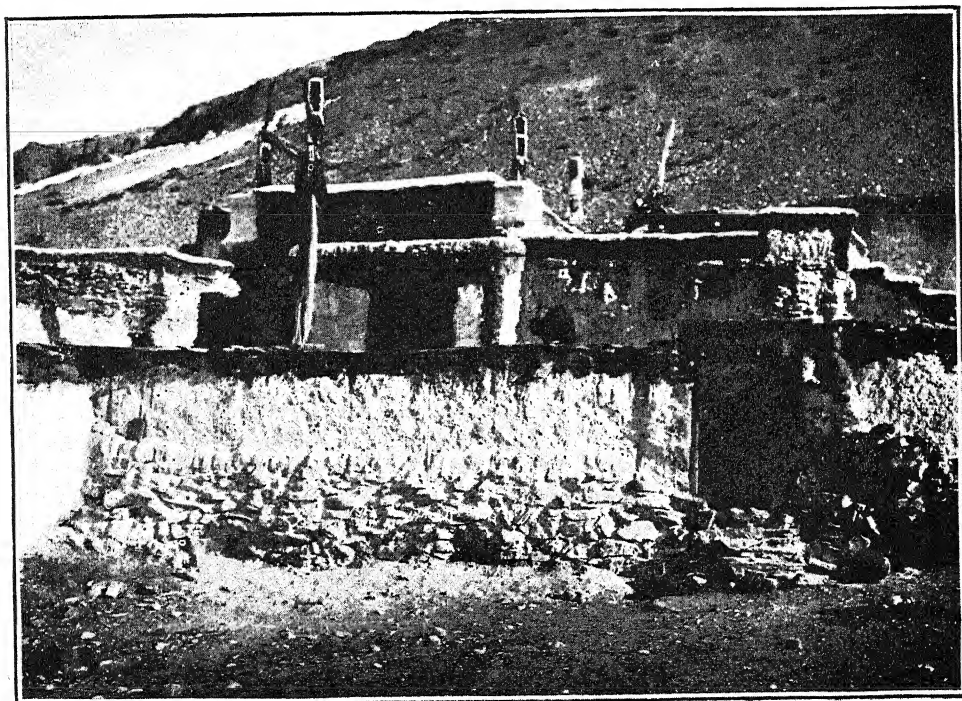


Fig. 2. Monastery at Tirthapuri.

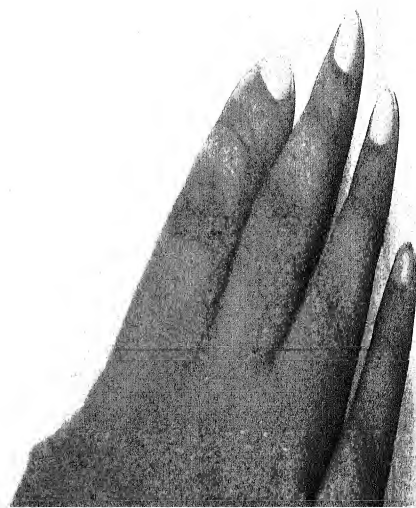




Fig. 1. Lama near a spring close to the source of the Sutlej, Dolchu-Gompa.

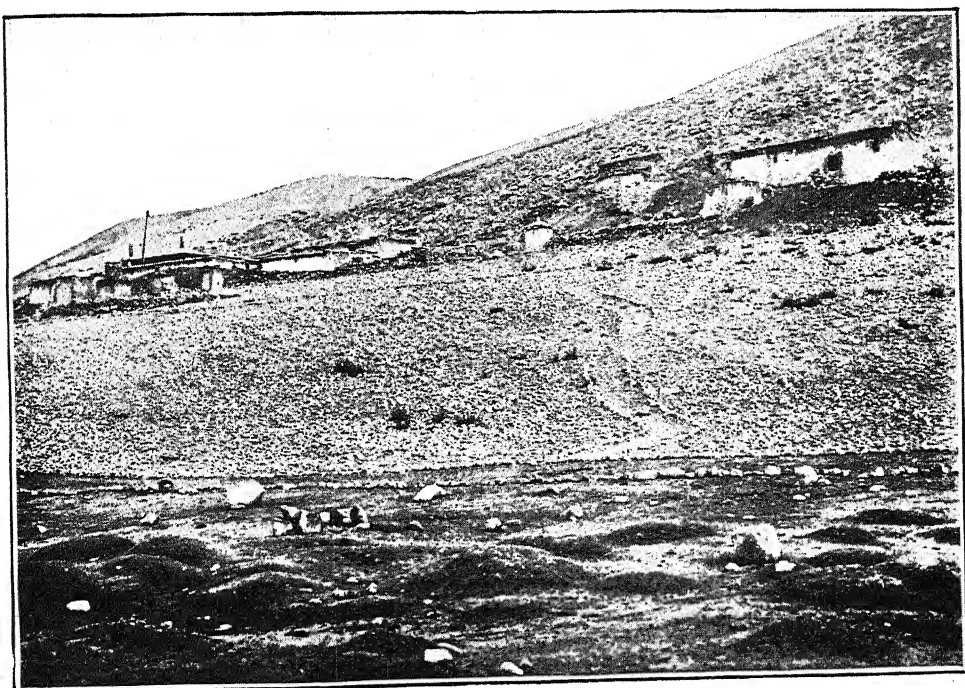
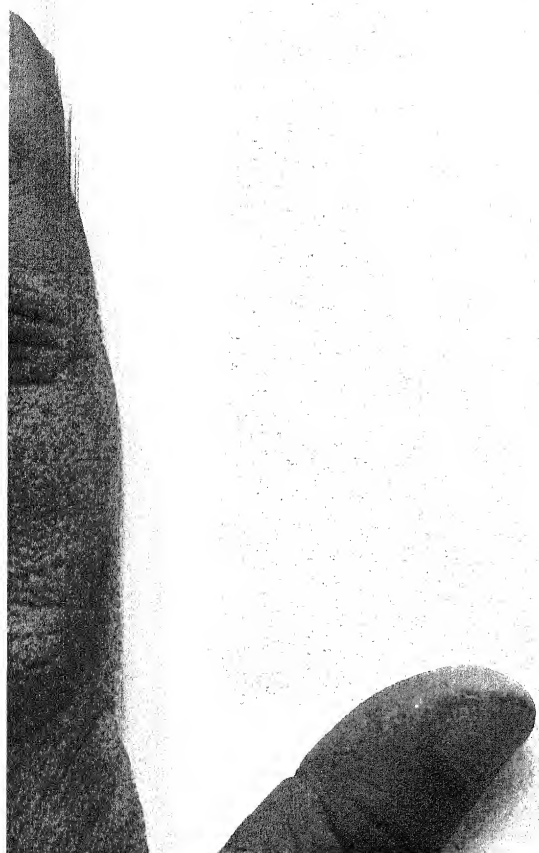
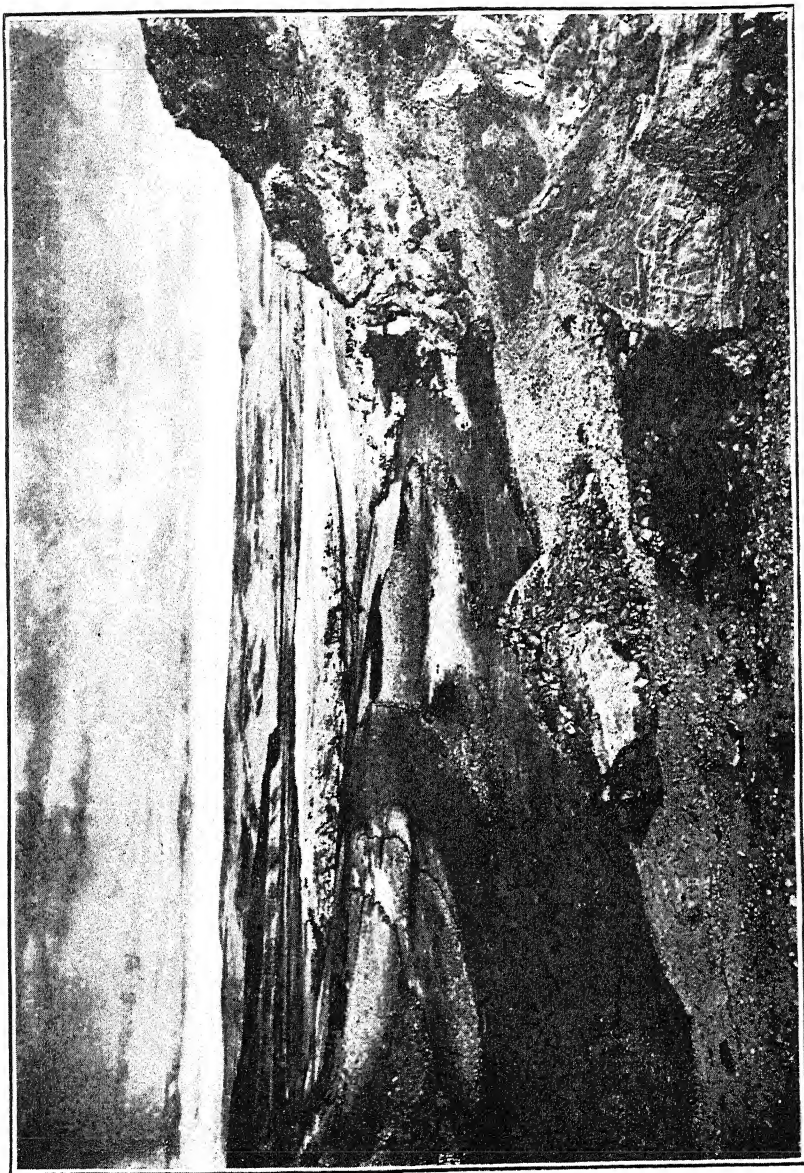


Fig. 2. Dolchu Monastery.



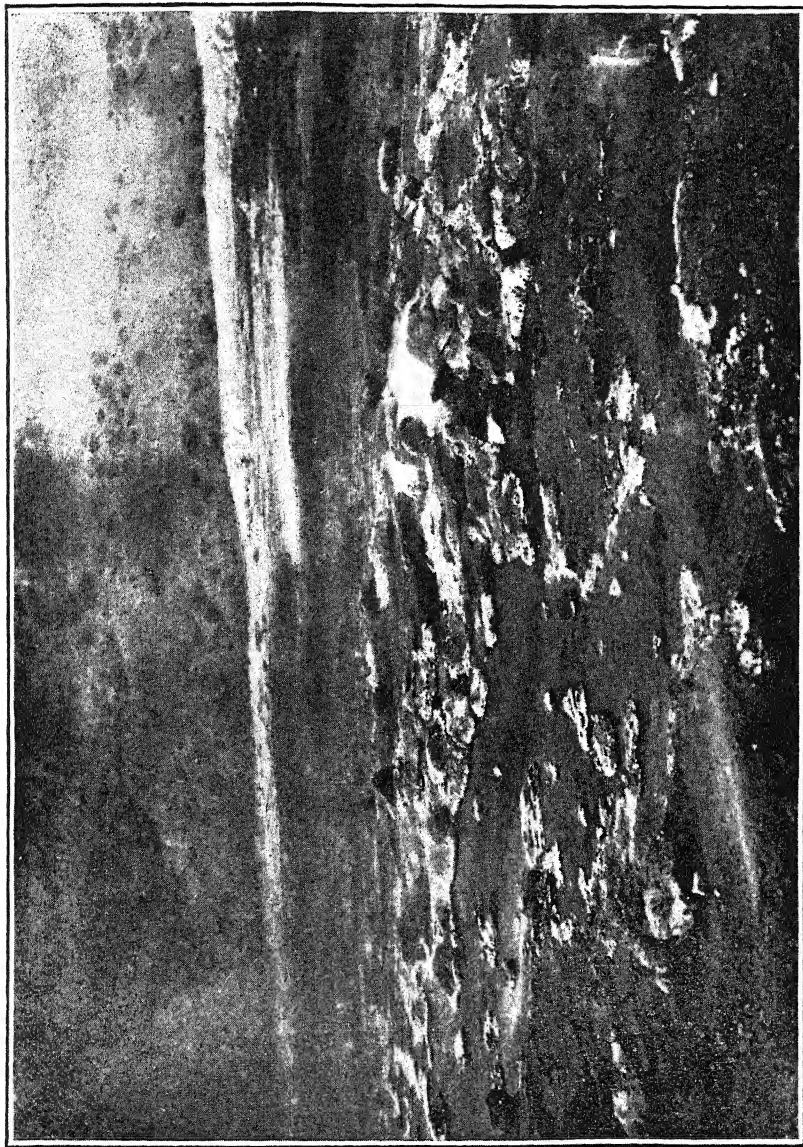




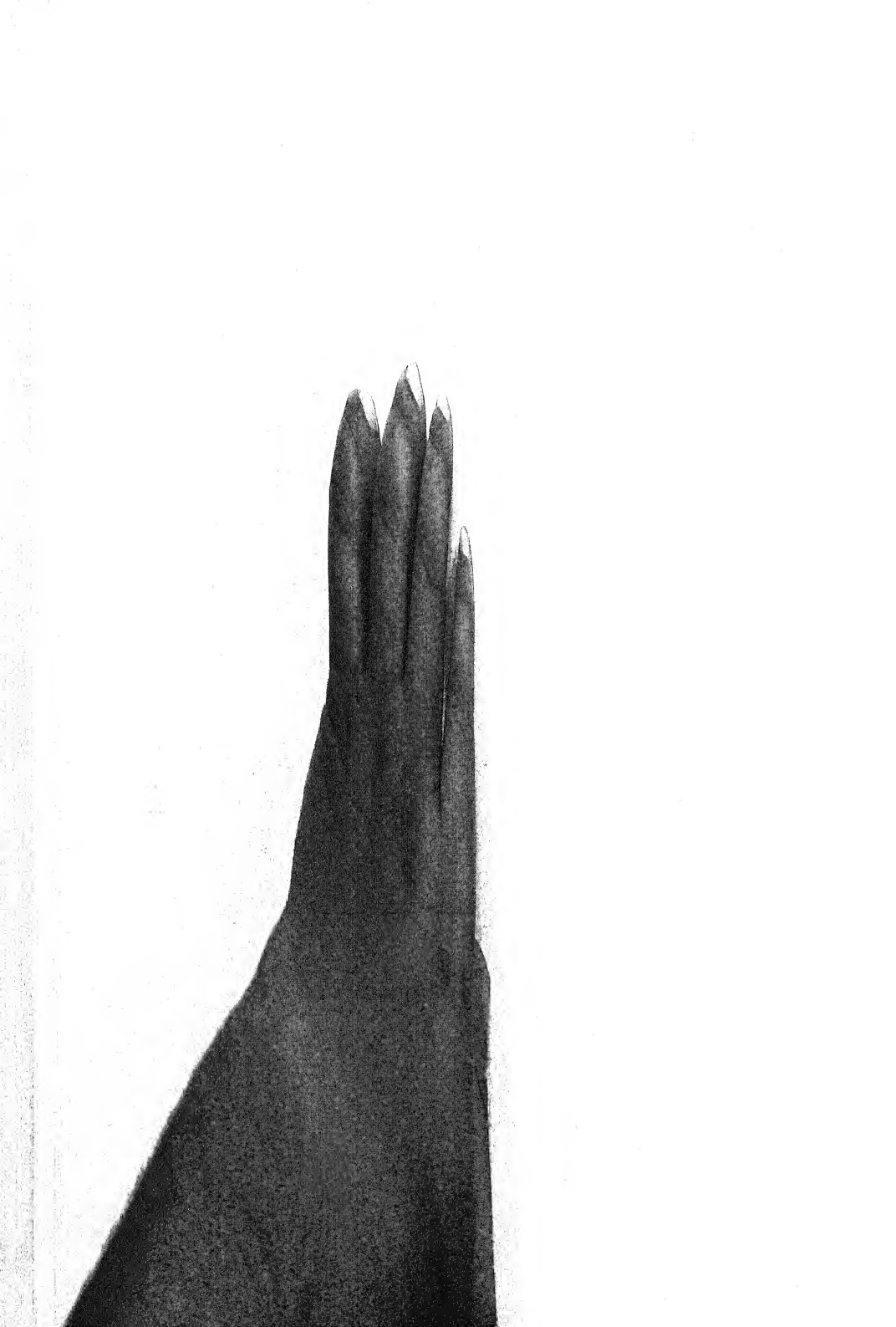
The Sutlej at Tirthapuri. Note inscription : *Om mani padme hum.*

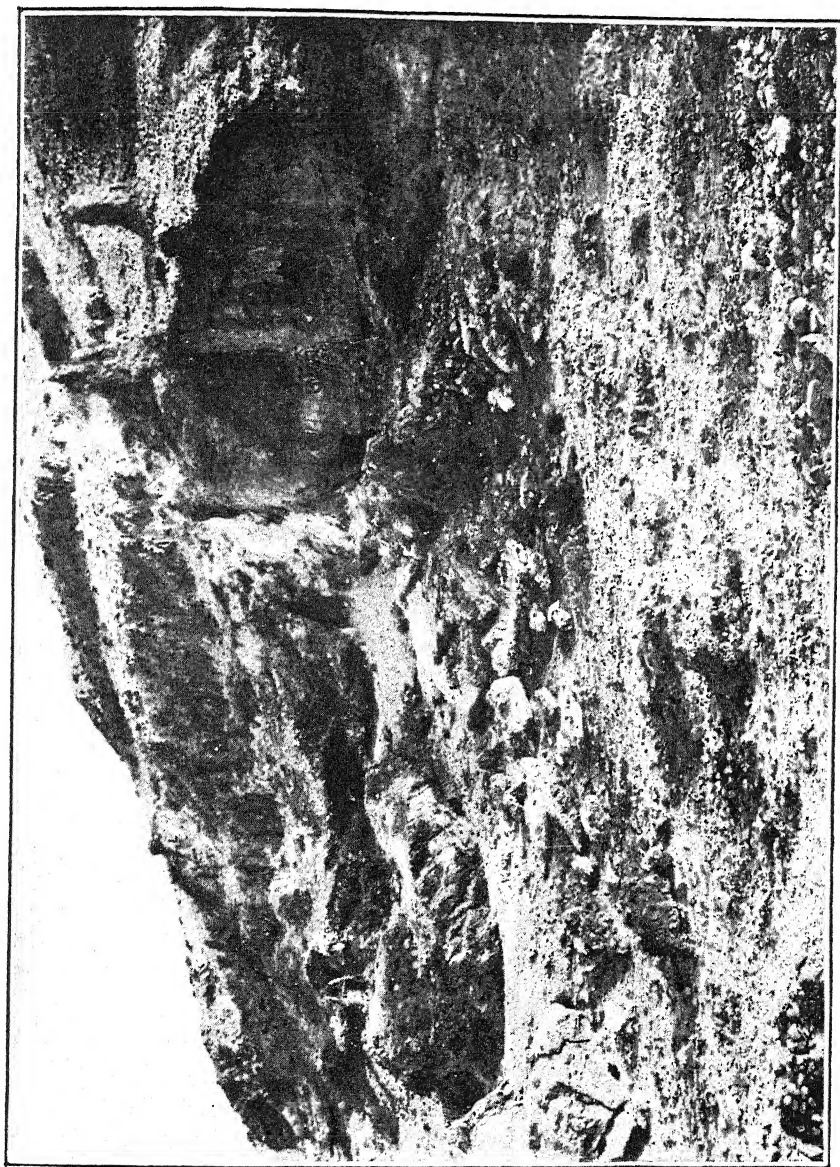




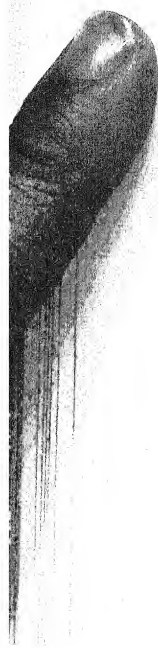


Hot spring at Tirthapuri.





Lime deposits at Tirthapuri. Note the inscription : *Om mani padme hum.*



## Meteorological Normals of Calcutta.

By V. V. SOHONI.

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#### Plate :—

Typical pressure-tube anemograms.

### HISTORICAL INTRODUCTION.

Seasonal weather with its variations has always been an important factor in India. From the earliest times of British interest in this country more or less desultory observations were taken at the instance of various officers scattered in different parts of the country. Observations before 1865 have mostly been found to be of little value.

In Calcutta, at the Survey Office in Park Street, systematic observations commenced in 1853. Interest in the meteorology of India in general, and of Bengal in particular, received an impetus after the great cyclone that visited Calcutta in October 1864. It was accompanied by a storm wave up the Hugly.

Over 80,000 human beings were drowned or died of exposure and a great part of the shipping on the river was wrecked. As a result of the awakening of interest in weather phenomena, five provincial systems of observations were evolved during the period 1865-1874. The one for Bengal came into being in 1867, under the Reportership of Mr. H. F. Blanford, who was then Professor of Science in the Presidency College and one of the honorary secretaries of the Asiatic Society of Bengal.

About 1874, on the recommendation of the English Meteorological Council a reorganisation of the observational

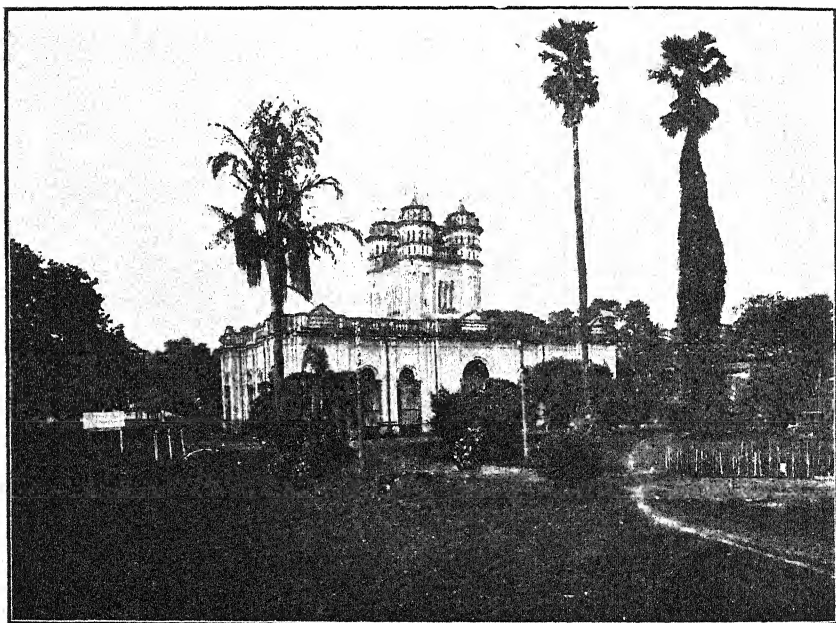


Fig. 1. Alipore Observatory.

work in India was contemplated by Government, and Mr. Blanford was appointed the Imperial Reporter. He drew up a scheme for an all-India service, which was launched in 1875. The Alipore Observatory was started as one of the initial items of this scheme. The objects of the observatory were manifold. Some of them were:—recording of observations of various meteorological elements, maintaining autographic instruments also for this purpose; providing for a central depot for verification of instruments for other observatories, and for a training ground for observers. Experimental observations and special investigations were also part of the observatory's programme

of pioneer work, which commenced in 1877. After the establishment of this institution, observations at the Survey Office were stopped. The normals given in the tables at the end, are based on the records of various self-recording instruments and eye observations extended over a series of some 20 years, at the Alipore Observatory (Fig. 1). Latitude  $22^{\circ} 32' N$ . Longitude  $88^{\circ} 24' E$ .

#### REFERENCE TO PREVIOUSLY PUBLISHED CALCUTTA DATA.

Apart from the mass of observational data for Calcutta, published in the Asiatic Society's Journal, the Meteorological Department's reports and Father Francotte's publication of observations at St. Xavier's College, there are a few memoirs of the India Meteorological Department in which observations of some elements or other have been discussed. They are:—

#### INDIAN METEOROLOGICAL MEMOIRS.

- Vol. I, Pt. I.—On the winds of Calcutta, by H. F. Blanford. This contains an analysis of 10 years' (August 1856–July 1866) hourly observations of the wind vane and four years' anemograms (July 1871–June 1875).
- Vol. II, Pt. V.—On observations of temperature and humidity at a height of 4 feet and 40 feet above the ground at Alipore Observatory, by S. A. Hill. April 1878 to March 1882.
- Vol. IV, Pt. I.—On the diurnal variation of the rainfall at Calcutta, by H. F. Blanford. Seven years' data (January 1878–December 1884) from a hyetograph have been considered.
- Vol. IX, Pt. VIII.—Discussion of hourly observations of temperature, air pressure, and aqueous vapour pressure as recorded by the autographic instruments in use at the Alipore Observatory, Calcutta, during the period 1881 to 1893, by E. Douglas Archibald. Harmonic analysis has been largely used in the discussion.
- Vol. XVIII, Pt. II.—A discussion of the anemographic observations recorded at Alipore from March 1877 to February 1904, by Sir John Eliot.

None of these, however, deal with the "normals" alone, and generally the periods of data used are comparatively short. The data for the tables at the end of this compilation, on the other hand, are for some 20 years; and further in cases of most elements, more or less synchronous. This is an attempt to collect together "normals" of all available elements, for purposes of reference.



## BLANFORD'S DESCRIPTION OF THE CLIMATE OF CALCUTTA.

For a pen picture of the normal march of the seasons in Calcutta it is best to quote Blanford<sup>1</sup> :—

“At Calcutta, the cool weather scarcely sets in before the second week of November, and lasts only to the middle or latter part of February. For ten or twelve weeks the weather is delightful, pleasantly cool in the daytime, and in the evening sufficiently cold to make a fire agreeable, though perhaps hardly indispensable to comfort. But the dampness of the climate manifests itself at night in frequent fogs on the river and the low grounds around; and in the native part of the town and the crowded suburbs, the smoke from the huts condenses the moisture of the air and enshrouds the habitations in a veil of fog that remains suspended in the still atmosphere. About the end of February the days begin to be appreciably warmer, the sun's power greater and his glare more intense, and in March it is sufficiently warm in the house to require that the punkah be set in movement once more after its three months' holiday. But the nights, or at least the hours after midnight, are still comparatively cool, and as the air is as yet not highly charged with moisture, to an acclimatised European the heat is by no means oppressive. During this month and April the rise of temperature is very rapid, and by the end of the latter month the afternoon readings of the thermometer are often as high as any recorded during the year.

“In December any rain is exceptional. In January and February it occurs less regularly and frequently than in Upper India, but there are generally two or three rainy days in these months, preceded by some days of close cloudy weather with light southerly winds; and when the weather clears a great fall of temperature follows and a renewal of the cold season. In March and April rain becomes more frequent, but in the shape of the thunder squalls known as nor'-westers which, as a rule, come on towards the evening, and are often preceded by a dust-storm. Their general character has been described in a previous part of this work. For a graphic but perhaps somewhat exaggerated account of one of these little storms the reader may be referred to M. Rousselet's well-known work on India, where, however, the writer appears to be under the mistaken impression that he had experienced a cyclone. These squalls are more frequent in May, and sometimes usher in a day or two of continuous rain; but, more frequently, an hour or two expends their force and they are followed by a refreshing night and a somewhat cooler day. Now and then, at intervals of some years, a cyclone may pass

<sup>1</sup> Blanford—A Practical Guide to the Climates and Weather of India, Ceylon and Burmah and the Storms of Indian Seas: 1889, pp. 152–154.

over Bengal in May or the early part of June but these more formidable visitors are perhaps rather to be expected at the end than at the beginning of the monsoon, and happily, at any season, are to be reckoned as meteorological rarities in Bengal.

"An advantage which Calcutta enjoys in the hot season, and which is denied to places much further inland, is the southerly breeze which, at the close of a hot day, often blows up from the wide estuary of the Hughly, bringing some hours of agreeable relief. It does not last beyond midnight, but it mitigates the heat of the dinner hour, and renders the southern verandahs of the large Chowringhee houses pleasant places for the post-prandial lounge.

"At length, in the early part of June, the clouds gather, more thickly, while the barometer falls to a lower point than it has reached since the beginning of the year; and in the first or second week, heavy and continuous rain ushers in the monsoon. This first burst of the rains usually accompanies a cyclonic storm formed either at the head of the bay or over the delta itself. As has been explained in a previous part of this work, such storms are not attended with very strong winds, at least on land, though the weather may be stormy at sea; and the barometric depression at their centre does not exceed two or three-tenths of an inch. The first onset generally carries the rains to the greater part of Bengal, and sometimes, but not always, to Behar. As a rule, the rainfall does not penetrate to the Upper Provinces till some days or even weeks later. Its immediate effect is a great fall of the day temperature; and the comparative coolness, supervening on many weeks of close oppressive weather, brings a sense of relief. Bursts of rain of a similar character alternating with sporadic showers and an occasional rainless interval rarely lasting more than a day or two, follows in succession through July and August. The air is saturated with vapour; vegetation grows apace, and indoors and out of doors every absorbent material reeks with moisture; but so long as the rainfall is abundant, and the intervals of its suspension short, the climate, if not exactly pleasant, is not very oppressive nor notably unhealthy. When, however, in September, the rainless intervals become longer, and the day temperature begins to rise, while the air, still highly charged with moisture, is almost motionless, the relaxed energy of the human system fairly rebels against this further trial of its endurance, and all who are not compelled by their avocations to remain at their post hasten to escape to the temporary refuge of a hill station. September and October are thus the most trying and unhealthy season of the year; and in Bengal it is not until the end of October or the early part of November that an appreciable fall of temperature brings relief.

"Such, according to the author's experience of many years, is the climate of Calcutta, and the description may serve as

fairly representative of that of the greater part of Bengal. Farther north indeed, and on the higher ground to the west of the delta, the hot season is somewhat drier and its temperature rather higher; and in Eastern Bengal the differences are of the opposite character."

#### NOTES ON TABLES OF NORMALS.

In the case of observations like pressure, temperature and wind direction, the hour mentioned is the instant of observation; while in the case of elements like rainfall, wind movement, sunshine, the hour indicated represents the 60 minutes ending with that hour; *e.g.*, period 10 hrs. to 11 hrs. is given as 11 under "hour". Local mean time is always implied; pressures are in inches of mercury, temperatures in Fahrenheit degrees; surface wind velocity in miles per hour, and upper air winds in metres per second.

*Air Pressure.* Table I gives the hourly normals of air pressure. Also see Fig. 2. These are based on tabulations of the records, for the period 1898-1917, of the Kew Barograph. A light from a lamp passing through a condenser and a slit cuts across the top of the mercury column of a barometer and is focussed on a drum carrying photographic paper. The drum rotates once in two days and when the paper is developed the line of demarcation between the light and dark areas of the photograms represents the variation of the barometric height. The values given (in inches of mercury) are corrected to 32° F. and have been also corrected so as to be comparable with the Alipore standard barometer, *i.e.*, corrected for "index error". The correction of the Alipore standard barometer to Kew Standard is supposed to be + .005". The values are not corrected for sea-level, nor for gravity. The height of the cistern of the instrument above sea-level is 20 feet.

*Temperature.* Table II gives the hourly normals of surface air temperature worked out from tabulations of the records of the Kew Thermograph for the period 1901-20. Also see Fig. 3. The thermograph photographically registers the dry and wet bulb temperature. At the north end of the observatory is a louvred pent-house in which the thermometers are kept, the bulbs being about 5 ft. above ground. Their bent stems are led into the observatory through a wooden wall. Near the top of the threads of the thermometers, there are small breaks in the column. Reflected light from lamps passes through these tiny gaps near the tops of the threads into a dark box, where it is focussed on to a drum covered with sensitive paper and driven by clockwork. Continuous records of temperature are thus obtained, there being suitable

provision of an occulting device for causing small gaps in the photographic records in order to identify hours.

It is worth while comparing the exposure of thermometers of this thermograph with that obtained in the meteorological thatched shed a few yards away, where thermometers are kept from which eye observations are taken for weather report and climatological purposes. Until a few years ago all the meteorological observatories in India housed their thermometers in similar open-sided thatched sheds, which have mostly been replaced by Stevenson Screens in recent years. In the shed the thermometers are about  $4\frac{1}{2}$  ft. above ground. A whole year's comparison (1921) between the records of Kew Thermograph and those of the shed readings of 10 hrs. and 16 hrs. gave the following mean differences.

|                            | Dry Bulb difference in °F. |         |       |
|----------------------------|----------------------------|---------|-------|
|                            | 10 hrs.                    | 16 hrs. | Mean  |
|                            | + 1.7                      | + 0.8   | + 1.3 |
| Shed minus Kew thermograph |                            |         |       |

Further comparisons were made in 1927-28 for 4 selected months August, November, February and May, and simultaneous ventilated Assmann Psychrometer observations were also taken in the shed and the pent-house, where the usual observations are from unventilated bulbs.

The following tables summarise the results :—

|     |                  | Dry bulb difference °F. |       |       |       |
|-----|------------------|-------------------------|-------|-------|-------|
|     |                  | 8 h.                    | 10 h. | 16 h. | Mean  |
|     |                  | + 0.1                   | + 0.5 | — 0.7 | 0.0   |
| (a) | August           | + 0.1                   | + 0.5 | — 0.7 | 0.0   |
|     | November         | + 0.2                   | + 3.9 | + 2.1 | + 2.1 |
|     | February         | + 0.3                   | + 3.8 | + 3.0 | + 2.7 |
|     | May              | — 0.2                   | + 0.6 | + 0.2 | + 0.2 |
|     | Mean of 4 months | + 0.1                   | + 2.2 | + 1.1 | + 1.1 |

Shed (unventilated)  
minus Kew thermograph  
(unventilated).

|                                                                          |                     | Dry bulb difference °F. |       |       |       |
|--------------------------------------------------------------------------|---------------------|-------------------------|-------|-------|-------|
|                                                                          |                     | 8 h.                    | 10 h. | 16 h. | Mean  |
| (b)<br>Shed (ventilated, i.e.,<br>Assmann) minus Shed<br>(unventilated). | August              | - 0.8                   | - 0.4 | - 0.1 | - 0.4 |
|                                                                          | November            | - 1.7                   | + 0.3 | + 0.3 | - 0.4 |
|                                                                          | February            | - 1.7                   | - 0.2 | + 0.7 | - 0.4 |
|                                                                          | May                 | - 0.6                   | + 0.1 | + 0.5 | 0.0   |
|                                                                          | Mean of<br>4 months | - 1.2                   | - 0.1 | + 0.3 | - 0.3 |

These results roughly indicate—

(a) that in the non-rainy, cold and non-cloudy months the louvred pent-house situated as it is adjoining the observatory building and in the proximity of a number of trees exerts a shielding influence, the thermometers in it registering from about 2° to 4° less than those in the open shed, during the hotter portion of the day. The effect presumably is much less marked in the hot weather and the monsoon.

(b) that during the cooler and less breezy portion of the day and night (as represented by 8 hrs.) the unventilated readings in the shed are generally higher by a degree or more (about 2° in the winter months), than the ventilated readings. During the hotter portion of the day (with which also is associated greater breeziness) this effect for all practical purposes vanishes.

Table III contains the monthly normals of maximum temperature, minimum temperature, the wet minimum temperature and the grass minimum temperature. The first two are based on 33 years' data and have been already published in the book of normals (Indian Meteorological Memoirs, Vol. XXII, Pt. 3). The normals of wet minimum and the grass minimum were worked out from data for 1901-1920. The grass minimum thermometer which is supposed to register the minimum attained by nocturnal radiation has always been exposed on a felt pad fixed on a thin wooden block on the ground, supposed to provide an exposure of non-varying character and simulating a grass lawn in effect.

*Ground Temperature.* Table IV contains normals of ground temperature based on observations from 1890 to 1904. Observation times were for all these years fixed at 5½ hrs., 13½ hrs. and 21½ hrs. Four thermometers used to be read. One was kept flat with the bulb touching the sur-

face of bare ground and the others were buried with bulbs at depths of 1 ft., 3 ft. and 6 ft., in the soil. One feels some doubt about the satisfactoriness or the constancy of the exposure of the surface thermometer. Probably the normals at best indicate only very broadly, the variations of the temperature of the surface of the soil, from month to month.

While dealing with temperatures, it may not be out of place to mention the Solar Radiation Thermometer (Black bulb *in vacuo*), at Calcutta. Blanford, in his book referred to on page 4, gives the following values based on observations in 1885, which show roughly the order of sun thermometer readings to be expected.

|           |    | Temperature<br>in the sun<br>°F. | Excess over<br>shade<br>maximum. |
|-----------|----|----------------------------------|----------------------------------|
| January   | .. | 137                              | 55                               |
| February  | .. | 145                              | 64                               |
| March     | .. | 155                              | 63                               |
| April     | .. | 159                              | 62                               |
| May ..    | .. | 165                              | 66                               |
| June ..   | .. | 162                              | 71                               |
| July ..   | .. | 160                              | 71                               |
| August    | .. | 155                              | 67                               |
| September | .. | 155                              | 66                               |
| October   | .. | 155                              | 67                               |
| November  | .. | 146                              | 62                               |
| December  | .. | 140                              | 65                               |

*Humidity.* Table V contains hourly normals of the wet bulb temperature. These are based on the data (1901-1920) from records of the wet bulb of the Kew thermograph described on page 242. The wet bulb is alongside the dry bulb and registration is on the same sensitive paper. The wet bulb is non-ventilated. A comparison between the Kew thermograph, shed thermometers and the Assmann Psychrometer observations, similar to that made for the dry bulb thermometers and described on page 243 gives the following results :—

*A year's comparison.*

(1921.)

|                            |    | Wet Bulb difference in ° F. |       |      |
|----------------------------|----|-----------------------------|-------|------|
|                            |    | 10 h.                       | 16 h. | Mean |
|                            |    |                             |       |      |
| Shed minus Kew thermograph | .. | +1.1                        | +0.3  | +0.7 |

(1927-1928.)

|                         |                   | Wet Bulb difference ° F. |       |       |      |
|-------------------------|-------------------|--------------------------|-------|-------|------|
|                         |                   | 8 h.                     | 10 h. | 16 h. | Mean |
|                         |                   |                          |       |       |      |
| (a) Shed (unventilated) | August ..         | -1.0                     | -0.8  | -1.6  | -1.1 |
| minus Kew thermo-       | November          | -0.6                     | +0.8  | +0.1  | +0.1 |
| graph.                  | February          | -0.5                     | +1.4  | +0.8  | +0.6 |
| (Unventilated)          | May ..            | +0.1                     | 0.0   | -0.2  | -0.1 |
|                         | Mean of 4 months. | -0.5                     | +0.3  | -0.2  | -0.1 |

|                      |                   | Wet bulb difference ° F. |       |       |       |
|----------------------|-------------------|--------------------------|-------|-------|-------|
|                      |                   | 8 h.                     | 10 h. | 16 h. | Mean. |
|                      |                   |                          |       |       |       |
| (b) Shed (ventilated | August ..         | -0.4                     | -0.3  | -0.3  | -0.3  |
| i.e., Assmann)       | November          | -0.4                     | +0.5  | +1.1  | +0.4  |
| minus                | February          | -0.4                     | +0.6  | +1.0  | +0.4  |
| Shed (unventilated)  | May ..            | -0.4                     | 0.0   | +0.3  | 0.0   |
|                      | Mean of 4 months. | -0.4                     | +0.2  | +0.5  | +0.1  |

(a) The differences between shed and pent-house range from 0 to about  $1^{\circ}$ . In the hot weather they seem to be negligible and in the monsoon of the order of  $1^{\circ}$  the shed value being lower. In the cold weather apparently the shed wet bulb is lower in the cooler portion of the day and higher in the warmer.

(b) At 8 hrs. the difference between ventilated and un-ventilated wet bulb seems to be always  $0.4^{\circ}$ , the ventilated value being lower. In the hot part of the day this does not seem to hold good except probably in the monsoon.

Table VI shows the hourly values of relative humidity (percentage of saturation) and Table VII the corresponding values of vapour tension in inches of mercury at  $32^{\circ}$  F. Also see Figs. 3 and 4.

*Rainfall.* Table VIII contains the normals of monthly rainfall in inches according to different hours of the day, based on the records, for 1905-1924, of the Beckley's autographic tilting bucket raingauge. Also see Fig. 5. This raingauge was located in a small room, within a few yards of the enclosure containing the other raingauges of the observatory. The funnel receiving the rain was in the roof of the room, 8 ft. above the ground. Ordinary raingauges have their funnel rims just a foot above the ground.

Scattered through the period 1911-1924 there were small gaps of a few months duration when the Beckley raingauge was not working. The tabulations of the Beckley records were therefore supplemented by the records of the Hellmann's self-recording syphon raingauge. The total period of such supplements is 14 months, *i.e.*, only about 6 % of the whole period of 20 years.

In this connection it is interesting to compare the monthly normals derived from Beckley raingauge with those of the ordinary raingauge. The following table summarises this information.



## MONTHLY RAINFALL.

|           |    | Beckley 20<br>years<br>1905-1924. | Ordinary<br>20 years<br>1905-1924. | Ordinary<br>43 years <sup>1</sup><br>ending 1920. | Number of<br>rainy<br>days. <sup>2</sup> |
|-----------|----|-----------------------------------|------------------------------------|---------------------------------------------------|------------------------------------------|
| January   | .. | 0.36                              | 0.44                               | 0.34                                              | 0.7                                      |
| February  | .. | 1.28                              | 1.22                               | 1.10                                              | 1.6                                      |
| March     | .. | 1.57                              | 1.63                               | 1.44                                              | 2.4                                      |
| April ..  | .. | 1.93                              | 2.11                               | 1.89                                              | 3.2                                      |
| May ..    | .. | 5.02                              | 4.93                               | 5.75                                              | 7.3                                      |
| June ..   | .. | 12.87                             | 13.35                              | 11.90                                             | 13.3                                     |
| July ..   | .. | 13.97                             | 12.74                              | 12.51                                             | 17.8                                     |
| August    | .. | 13.64                             | 13.80                              | 12.69                                             | 18.3                                     |
| September | .. | 9.10                              | 9.00                               | 9.87                                              | 13.2                                     |
| October   | .. | 4.73                              | 4.30                               | 4.19                                              | 6.0                                      |
| November  | .. | 0.46                              | 0.67                               | 0.66                                              | 1.0                                      |
| December  | .. | 0.13                              | 0.16                               | 0.20                                              | 0.4                                      |
| Year ..   | .. | 65.06                             | 64.35                              | 62.54                                             | 85.2                                     |

It may not be out of place also to record here the frequency of heavy rain at Alipore.

## FREQUENCY OF HEAVY RAIN.

*Alipore.*

| Rainfall in 24 hours<br>ending 8 hrs. |    |    | Number of occasions during<br>30 years 1891-1920. |
|---------------------------------------|----|----|---------------------------------------------------|
| 3" to 4"                              | .. | .. | 32                                                |
| 4" to 5"                              | .. | .. | 15                                                |
| 5" to 6"                              | .. | .. | 9                                                 |
| 6" to 7"                              | .. | .. | 4                                                 |
| 7" to 8"                              | .. | .. | 2                                                 |
| 8" to 9"                              | .. | .. | 3                                                 |
| 9" to 10"                             | .. | .. | ..                                                |
| 10" to 11"                            | .. | .. | 1                                                 |
| 11" to 12"                            | .. | .. | 1                                                 |
| 12" to 13"                            | .. | .. | ..                                                |
| 13" to 14"                            | .. | .. | ..                                                |
| 14" to 15"                            | .. | .. | 1                                                 |

*Cloud.* Tables IX to XI give the relative frequency of different kinds of clouds in different months for three observation times, 8 hrs., 10 hrs., and 16 hrs. Records of the period 1901-1920 were consulted in preparing these tables and the figures given represent the mean number of days in a given month on which a particular kind of cloud prevails at the specified hour. There are, of course, a number of occasions when several kinds of cloud co-exist and this results in the total

<sup>1</sup> Published in Indian Meteorological Memoirs, Vol. XXIII, Pt. 7.

<sup>2</sup> A rainy day is a day on which 0.1" or more of rain is recorded.

of cloud-unit occasions in a month exceeding the number of days in the month.

Table XII shows the amount of cloudiness at 8, 10 and 16 hrs. in different months, on the basis of whole sky being taken as 10.

*Sunshine.* Table XIII indicates the average hours of bright sunshine in different months. They are based on sunshine records of a Whipple-Casella Sunshine-Recorder for the period 1889 to 1908.

*Wind.* The autographic records of the standard instrument, a Robinson-Beckley anemograph have been used in finding out the hourly normals of wind direction and velocity. The rotating cups of the instrument are on one of the towers of the Observatory, at a height of about 60 ft. The cups are geared on to a cylinder with a projecting metal helix which by contact pressure on "metallic" paper mounted on a rotating drum records the run of the wind. The wind direction is also recorded by means of vanes which rotate with change in wind direction and are geared on to a recorder similar to that registering the run of the wind. The records for the period 1901-1920 were used. Table XIV contains values of the normal hourly wind velocity. Also see Fig. 5. Table XV gives the hourly mean monthly direction of wind. Tables XVI to XXVII show the hourly percentage frequency of wind direction reduced to 8 points of the compass, month by month.

The records of a Robinson-Beckley instrument are not useful for the study of wind structure; but in Plate 16 are reproduced three pressure-tube anemograms of days, more or less randomly selected, but typical of different seasons. In the same plate is included an anemogram during the passage of a monsoon cyclonic storm, fairly close to Calcutta.

*Upper Air Winds.* Tables XXVIII to XXXI contain the normals of upper winds. The observations on which these normals are based cover the period 1915-25. Until July 1923 the pilot balloon station was at Alipore (Calcutta), but it was found that the visibility in Calcutta is not satisfactory and is usually positively bad in the winter months. The main cause of this is apparently the smoke from the city and from the mills to the north of Calcutta. The prevailing northerly winds of the winter bring this smoke from the mill area south to the vicinity of Calcutta. Most probably, there is also a persistent temperature inversion in this region, during these months, at least in the lower layers of the free air, which helps to maintain the atmospheric turbidity. The upper air station was therefore shifted to Diamond Harbour some 40 miles down the river Hughly to the south, where the flights proved more successful. The normals were computed at the Aerological Observatory of Agra.

## SOME ABNORMAL RECORDS OF CALCUTTA.

In conclusion, although this paper deals with meteorological normals, it may be worth mentioning some of the most abnormal records of Alipore.

| "Record" values.                                                                                   |                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum temperature ..                                                                             | 111.3° on 31st May, 1924.                                                                                                                                                                                                                                                                |
| Minimum temperature ..                                                                             | 44.4° on 20th January, 1899.                                                                                                                                                                                                                                                             |
| Grass Minimum temperature ..                                                                       | 32.3° on 7th February, 1883.                                                                                                                                                                                                                                                             |
| Wind velocity in gusts exceeding 60 m. p. h.                                                       | 28th April, 1914 } both during<br>24th May, 1926 } nor'-westers.<br>61 to 65 m.p.h.                                                                                                                                                                                                      |
| During 1878-1927 { Highest annual rainfall<br>{ Lowest       ,,       ,,                           | 89.32" in 1900.<br>39.38" ,, 1895.                                                                                                                                                                                                                                                       |
| Examples of extremely intense fall of rain.                                                        | 3.50" in 1 hour, 1.30 A.M. to 2.30 A.M. on 22nd July 1926 during a thunderstorm. Total rain in the storm 5.26" in 3 hours, 10 minutes, out of which 4.20" fell in 1½ hours.<br>3.25" in 40 minutes during an afternoon thunderstorm on 6th May 1928, i.e., at the rate of 4.88" an hour. |
| <sup>1</sup> Daily falls of rain exceeding 10" during period 1891-1927 (8 A.M. to 8 A.M. records). | 14.53" on 20th September, 1900.<br>11.95" ,, 18th June, 1908.                                                                                                                                                                                                                            |
| Falls exceeding 10" in 24 hours (1912-1927).                                                       | 12.75" between 8 P.M. 5th August, 1920 and 8 P.M. 6th August.<br>10.49" between 10 P.M. of 24th September, 1922 and 10 P.M. 25th.                                                                                                                                                        |

<sup>1</sup> *Ind. Met. Mem.*, Vol. XXI, Pt. 3 pp. 33, 35.

TABLE I.  
NORMALS OF PRESSURE.  
(1898-1917.)

| Hour. | January. | February. | March. | April. | May.   | June.  | July.  | August. | September. | October. | November. | December. | Year.  |
|-------|----------|-----------|--------|--------|--------|--------|--------|---------|------------|----------|-----------|-----------|--------|
| 0     | 30.038   | 29.970    | 29.874 | 29.765 | 29.683 | 29.562 | 29.554 | 29.606  | 29.712     | 29.849   | 29.965    | 30.029    | 29.800 |
| 1     | 30.031   | 29.963    | 29.857 | 29.752 | 29.668 | 29.546 | 29.539 | 29.591  | 29.701     | 29.839   | 29.957    | 30.022    | 29.789 |
| 2     | 30.022   | 29.952    | 29.847 | 29.739 | 29.656 | 29.536 | 29.527 | 29.578  | 29.687     | 29.830   | 29.947    | 30.013    | 29.778 |
| 3     | 30.012   | 29.941    | 29.839 | 29.729 | 29.650 | 29.529 | 29.514 | 29.568  | 29.678     | 29.825   | 29.942    | 30.005    | 29.769 |
| 4     | 30.009   | 29.937    | 29.836 | 29.730 | 29.653 | 29.529 | 29.514 | 29.565  | 29.676     | 29.824   | 29.940    | 30.004    | 29.768 |
| 5     | 30.015   | 29.943    | 29.846 | 29.744 | 29.663 | 29.535 | 29.519 | 29.570  | 29.683     | 29.834   | 29.948    | 30.011    | 29.776 |
| 6     | 30.029   | 29.960    | 29.865 | 29.760 | 29.680 | 29.548 | 29.530 | 29.580  | 29.694     | 29.851   | 29.966    | 30.025    | 29.791 |
| 7     | 30.050   | 29.983    | 29.890 | 29.785 | 29.700 | 29.565 | 29.546 | 29.600  | 29.714     | 29.873   | 29.989    | 30.049    | 29.812 |
| 8     | 30.075   | 30.006    | 29.912 | 29.805 | 29.714 | 29.575 | 29.556 | 29.612  | 29.732     | 29.890   | 30.010    | 30.071    | 29.830 |
| 9     | 30.100   | 30.028    | 29.930 | 29.819 | 29.727 | 29.582 | 29.567 | 29.624  | 29.744     | 29.902   | 30.025    | 30.083    | 29.845 |
| 10    | 30.104   | 30.039    | 29.934 | 29.820 | 29.734 | 29.584 | 29.568 | 29.625  | 29.746     | 29.902   | 30.023    | 30.082    | 29.848 |
| 11    | 30.088   | 30.023    | 29.925 | 29.810 | 29.719 | 29.577 | 29.563 | 29.618  | 29.737     | 29.887   | 30.005    | 30.075    | 29.836 |
| 12    | 30.057   | 29.998    | 29.900 | 29.790 | 29.697 | 29.563 | 29.551 | 29.604  | 29.718     | 29.862   | 29.975    | 30.044    | 29.813 |
| 13    | 30.020   | 29.963    | 29.868 | 29.760 | 29.672 | 29.534 | 29.532 | 29.584  | 29.692     | 29.833   | 29.941    | 30.007    | 29.785 |
| 14    | 29.994   | 29.934    | 29.837 | 29.731 | 29.648 | 29.525 | 29.512 | 29.561  | 29.666     | 29.808   | 29.919    | 29.984    | 29.760 |
| 15    | 29.978   | 29.914    | 29.811 | 29.707 | 29.622 | 29.504 | 29.492 | 29.542  | 29.646     | 29.794   | 29.907    | 29.970    | 29.732 |
| 16    | 29.975   | 29.908    | 29.800 | 29.693 | 29.602 | 29.487 | 29.479 | 29.531  | 29.639     | 29.791   | 29.906    | 29.968    | 29.732 |
| 17    | 29.981   | 29.912    | 29.799 | 29.694 | 29.603 | 29.487 | 29.476 | 29.529  | 29.641     | 29.796   | 29.915    | 29.976    | 29.736 |
| 18    | 29.989   | 29.917    | 29.808 | 29.694 | 29.613 | 29.497 | 29.486 | 29.538  | 29.652     | 29.806   | 29.927    | 29.989    | 29.744 |
| 19    | 30.009   | 29.934    | 29.825 | 29.716 | 29.638 | 29.520 | 29.508 | 29.554  | 29.674     | 29.828   | 29.950    | 30.009    | 29.764 |
| 20    | 30.022   | 29.954    | 29.848 | 29.742 | 29.663 | 29.541 | 29.528 | 29.581  | 29.696     | 29.852   | 29.965    | 30.023    | 29.784 |
| 21    | 30.040   | 29.971    | 29.872 | 29.764 | 29.683 | 29.559 | 29.549 | 29.606  | 29.719     | 29.862   | 29.977    | 30.035    | 29.803 |
| 22    | 30.044   | 29.977    | 29.877 | 29.775 | 29.694 | 29.572 | 29.562 | 29.617  | 29.726     | 29.865   | 29.980    | 30.042    | 29.811 |
| 23    | 30.040   | 29.977    | 29.875 | 29.774 | 29.692 | 29.572 | 29.563 | 29.617  | 29.724     | 29.861   | 29.977    | 30.039    | 29.802 |
| Mean  | 30.030   | 29.963    | 29.861 | 29.753 | 29.670 | 29.543 | 29.531 | 29.583  | 29.696     | 29.844   | 29.961    | 30.024    | 29.788 |

TABLE II  
NORMALS OF SURFACE AIR TEMPERATURE.  
(1901-1920.)

| Hour. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Year. |
|-------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------|
| 0     | 60.4     | 64.8      | 73.8   | 79.5   | 81.2 | 82.0  | 81.4  | 81.5    | 80.5       | 77.0     | 68.3      | 59.9      | 74.3  |
| 1     | 59.7     | 64.4      | 73.2   | 79.0   | 80.8 | 81.6  | 81.3  | 81.0    | 80.3       | 76.7     | 67.8      | 59.3      | 73.8  |
| 2     | 59.3     | 63.7      | 72.7   | 78.6   | 80.5 | 81.4  | 81.1  | 80.8    | 80.1       | 76.5     | 67.5      | 59.4      | 73.4  |
| 3     | 58.9     | 63.3      | 72.2   | 78.2   | 80.2 | 81.2  | 80.9  | 80.6    | 79.9       | 76.2     | 67.1      | 58.5      | 73.1  |
| 4     | 58.6     | 62.9      | 71.8   | 77.8   | 79.9 | 80.9  | 80.7  | 80.3    | 79.6       | 76.1     | 66.8      | 58.3      | 72.8  |
| 5     | 58.2     | 62.4      | 71.3   | 77.5   | 79.7 | 80.8  | 80.6  | 80.3    | 79.6       | 75.8     | 66.4      | 57.8      | 72.5  |
| 6     | 57.9     | 62.2      | 71.0   | 77.4   | 80.0 | 81.0  | 80.7  | 80.2    | 79.5       | 75.7     | 66.2      | 57.5      | 72.4  |
| 7     | 57.6     | 62.0      | 71.5   | 78.7   | 81.6 | 82.2  | 81.6  | 81.1    | 80.8       | 76.6     | 66.9      | 57.4      | 73.8  |
| 8     | 59.5     | 64.2      | 74.2   | 81.3   | 84.1 | 83.9  | 82.9  | 82.4    | 82.1       | 78.7     | 69.4      | 60.0      | 75.2  |
| 9     | 63.4     | 67.9      | 77.6   | 84.4   | 86.7 | 86.0  | 84.3  | 83.7    | 83.8       | 80.8     | 72.4      | 63.8      | 77.9  |
| 10    | 66.9     | 71.2      | 80.7   | 87.2   | 89.1 | 87.4  | 85.1  | 84.8    | 84.7       | 82.4     | 75.0      | 67.2      | 80.1  |
| 11    | 69.5     | 73.8      | 83.2   | 89.5   | 90.8 | 88.3  | 86.2  | 85.6    | 85.6       | 83.6     | 76.9      | 69.8      | 81.9  |
| 12    | 71.5     | 75.9      | 85.2   | 91.3   | 92.4 | 89.5  | 87.0  | 86.3    | 86.3       | 84.4     | 78.2      | 71.6      | 83.3  |
| 13    | 73.0     | 77.3      | 86.3   | 92.8   | 93.3 | 89.9  | 87.4  | 86.5    | 86.4       | 84.8     | 79.0      | 72.9      | 84.1  |
| 14    | 73.9     | 78.3      | 87.7   | 93.5   | 94.1 | 90.1  | 87.3  | 86.4    | 86.5       | 85.1     | 79.6      | 73.7      | 84.7  |
| 15    | 74.3     | 78.8      | 88.3   | 93.8   | 94.0 | 89.9  | 87.1  | 86.1    | 86.3       | 85.0     | 79.6      | 74.0      | 84.8  |
| 16    | 74.2     | 78.7      | 88.3   | 92.9   | 93.1 | 89.3  | 86.7  | 85.7    | 85.7       | 84.6     | 79.3      | 73.8      | 84.4  |
| 17    | 72.9     | 77.8      | 86.6   | 90.2   | 90.9 | 88.2  | 85.7  | 84.9    | 84.6       | 83.1     | 77.0      | 71.4      | 82.8  |
| 18    | 68.4     | 74.2      | 83.2   | 87.1   | 88.4 | 86.6  | 84.8  | 82.8    | 83.2       | 80.6     | 73.9      | 66.9      | 80.1  |
| 19    | 65.7     | 70.9      | 79.8   | 84.4   | 86.2 | 84.0  | 83.5  | 82.8    | 82.2       | 79.3     | 71.9      | 64.5      | 78.0  |
| 20    | 64.2     | 69.0      | 78.1   | 82.7   | 84.2 | 83.8  | 82.9  | 82.4    | 81.7       | 78.5     | 70.5      | 63.3      | 76.8  |
| 21    | 62.9     | 67.8      | 76.6   | 80.7   | 83.1 | 82.7  | 82.1  | 82.0    | 81.4       | 77.9     | 69.9      | 61.9      | 75.9  |
| 22    | 62.0     | 66.7      | 75.6   | 80.7   | 82.3 | 82.7  | 82.4  | 81.8    | 81.1       | 77.5     | 69.0      | 61.1      | 75.2  |
| 23    | 61.2     | 65.8      | 74.6   | 80.1   | 81.7 | 82.3  | 81.8  | 81.5    | 80.8       | 77.1     | 68.4      | 60.4      | 74.6  |
| Mean  | 64.8     | 69.3      | 78.5   | 84.2   | 85.8 | 84.9  | 83.6  | 83.0    | 82.6       | 79.8     | 72.0      | 64.4      | 77.7  |

TABLE III.

NORMALS OF MAXIMUM AND MINIMUM TEMPERATURE.

|              | Maximum. Minimum. |      | Wet Minimum. Grass Minimum. |      |
|--------------|-------------------|------|-----------------------------|------|
|              | (33 years)        |      | (1901-1920)                 |      |
| January ..   | 77.3              | 55.5 | 54.6                        | 49.8 |
| February ..  | 82.0              | 60.0 | 58.6                        | 54.7 |
| March ..     | 90.9              | 69.3 | 65.5                        | 64.0 |
| April ..     | 95.6              | 75.7 | 71.8                        | 71.6 |
| May ..       | 94.5              | 77.5 | 74.5                        | 74.7 |
| June ..      | 91.5              | 78.8 | 76.6                        | 76.8 |
| July ..      | 88.4              | 78.6 | 77.3                        | 77.1 |
| August ..    | 87.6              | 78.4 | 77.4                        | 76.9 |
| September .. | 88.0              | 78.0 | 76.7                        | 76.0 |
| October ..   | 87.2              | 74.3 | 72.9                        | 71.0 |
| November ..  | 82.0              | 64.3 | 63.0                        | 59.8 |
| December ..  | 77.0              | 56.0 | 54.5                        | 49.4 |
| Year ..      | 86.8              | 70.5 | 68.6                        | 66.8 |

TABLE IV.

NORMALS OF GROUND TEMPERATURE.

(1890-1904.)

|              | Surface.           |                     |                     | 1 ft. depth.       |                     |                     | 3 ft. depth.       |                     |                     | 6 ft. depth.        |
|--------------|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|---------------------|
|              | 5 $\frac{1}{2}$ h. | 13 $\frac{1}{2}$ h. | 21 $\frac{1}{2}$ h. | 5 $\frac{1}{2}$ h. | 13 $\frac{1}{2}$ h. | 21 $\frac{1}{2}$ h. | 5 $\frac{1}{2}$ h. | 13 $\frac{1}{2}$ h. | 21 $\frac{1}{2}$ h. | 13 $\frac{1}{2}$ h. |
| January ..   | 54.0               | 79.0                | 57.7                | 67.7               | 67.7                | 68.3                | 71.6               | 72.2                | 71.7                | 77.3                |
| February ..  | 60.5               | 87.2                | 63.7                | 72.3               | 72.0                | 73.2                | 73.9               | 74.3                | 74.1                | 76.6                |
| March ..     | 68.8               | 103.9               | 72.7                | 79.7               | 79.3                | 80.8                | 79.1               | 79.3                | 79.2                | 78.1                |
| April ..     | 76.3               | 112.4               | 79.6                | 86.9               | 86.2                | 88.2                | 84.9               | 84.9                | 85.0                | 81.2                |
| May ..       | 80.3               | 108.0               | 81.8                | 89.3               | 88.4                | 90.6                | 88.0               | 87.7                | 88.0                | 83.9                |
| June ..      | 80.9               | 97.5                | 82.1                | 87.2               | 86.8                | 87.8                | 87.3               | 87.1                | 87.2                | 85.0                |
| July ..      | 80.9               | 93.6                | 82.1                | 86.1               | 85.6                | 86.5                | 86.2               | 86.0                | 86.2                | 84.9                |
| August ..    | 80.7               | 93.4                | 82.3                | 85.9               | 85.5                | 86.3                | 86.2               | 85.9                | 86.2                | 84.8                |
| September .. | 80.3               | 94.0                | 81.9                | 86.0               | 85.3                | 86.3                | 86.4               | 85.9                | 86.4                | 84.9                |
| October ..   | 75.3               | 93.4                | 77.3                | 83.5               | 83.1                | 83.8                | 85.2               | 84.9                | 85.1                | 84.8                |
| November ..  | 64.1               | 87.8                | 67.1                | 76.6               | 76.5                | 76.9                | 80.7               | 80.8                | 80.5                | 83.5                |
| December ..  | 53.9               | 79.9                | 57.4                | 68.8               | 69.3                | 69.1                | 74.3               | 75.1                | 74.3                | 80.5                |
| Mean ..      | 71.3               | 94.2                | 73.8                | 80.8               | 80.5                | 81.5                | 82.0               | 82.0                | 82.0                | 82.1                |

TABLE V.  
NORMALS OF WET BULB TEMPERATURE.  
(1901-1920.)

| Hour.   | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Year. |
|---------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------|
| 0       | 57.9     | 61.9      | 70.2   | 79.4   | 77.1 | 78.9  | 79.0  | 78.9    | 78.4       | 75.0     | 65.8      | 57.2      | 71.3  |
| 1       | 57.5     | 61.5      | 70.0   | 75.1   | 77.0 | 78.8  | 78.8  | 78.9    | 78.3       | 74.7     | 65.6      | 57.0      | 71.1  |
| 2       | 57.1     | 61.2      | 69.6   | 74.9   | 77.0 | 78.7  | 78.7  | 78.6    | 78.2       | 74.7     | 65.3      | 56.6      | 70.9  |
| 3       | 56.8     | 60.9      | 69.4   | 74.7   | 76.9 | 78.7  | 78.6  | 78.6    | 78.1       | 74.5     | 65.0      | 56.2      | 70.7  |
| 4       | 56.4     | 60.4      | 69.1   | 74.5   | 76.7 | 78.5  | 78.5  | 78.4    | 77.9       | 74.3     | 64.7      | 55.8      | 70.4  |
| 5       | 56.1     | 60.1      | 68.8   | 74.4   | 76.7 | 78.4  | 78.6  | 78.3    | 77.8       | 74.2     | 64.4      | 55.5      | 70.3  |
| 6       | 55.8     | 59.8      | 68.5   | 74.2   | 77.0 | 78.5  | 78.7  | 78.3    | 77.7       | 74.1     | 64.2      | 55.1      | 70.1  |
| 7       | 55.6     | 59.9      | 68.8   | 75.1   | 78.0 | 79.2  | 79.1  | 78.9    | 78.5       | 74.8     | 64.5      | 55.1      | 70.6  |
| 8       | 56.8     | 60.8      | 70.0   | 76.5   | 79.0 | 80.0  | 79.5  | 79.4    | 79.1       | 75.7     | 65.4      | 56.6      | 71.6  |
| 9       | 58.5     | 62.0      | 70.7   | 77.2   | 79.8 | 80.7  | 80.1  | 79.9    | 79.5       | 75.9     | 66.7      | 58.4      | 72.5  |
| 10      | 59.7     | 62.8      | 70.8   | 77.5   | 80.4 | 81.2  | 80.6  | 80.4    | 79.8       | 76.1     | 67.2      | 59.7      | 73.0  |
| 11      | 60.5     | 63.3      | 70.9   | 77.7   | 80.9 | 81.6  | 81.0  | 80.7    | 80.0       | 76.2     | 67.6      | 60.5      | 73.4  |
| 12      | 61.1     | 63.7      | 70.8   | 77.7   | 81.1 | 81.9  | 81.3  | 80.9    | 80.3       | 76.3     | 68.2      | 60.8      | 73.7  |
| 13      | 61.6     | 64.0      | 70.9   | 77.9   | 81.3 | 82.0  | 81.4  | 81.1    | 80.2       | 76.1     | 67.7      | 61.2      | 73.8  |
| 14      | 61.9     | 64.2      | 71.0   | 78.0   | 81.4 | 82.1  | 81.5  | 81.1    | 80.2       | 76.1     | 67.2      | 61.3      | 73.8  |
| 15      | 61.9     | 64.2      | 71.0   | 77.7   | 81.2 | 81.9  | 81.4  | 81.0    | 80.0       | 76.0     | 67.3      | 61.3      | 73.7  |
| 16      | 62.0     | 64.2      | 71.1   | 77.8   | 80.9 | 81.7  | 81.2  | 80.8    | 79.9       | 75.9     | 67.5      | 61.4      | 73.7  |
| 17      | 62.2     | 64.1      | 71.1   | 77.5   | 80.2 | 81.4  | 81.1  | 80.5    | 79.8       | 76.3     | 67.9      | 62.2      | 73.7  |
| 18      | 61.6     | 64.4      | 71.4   | 77.2   | 79.6 | 80.7  | 80.3  | 80.1    | 79.4       | 75.9     | 67.9      | 60.9      | 73.3  |
| 19      | 60.9     | 63.8      | 70.9   | 76.6   | 78.7 | 80.0  | 79.9  | 79.6    | 79.1       | 75.6     | 67.4      | 60.1      | 72.7  |
| 20      | 60.2     | 63.3      | 70.8   | 76.1   | 78.3 | 79.6  | 79.5  | 79.5    | 79.0       | 75.5     | 67.1      | 59.5      | 72.4  |
| 21      | 59.6     | 63.0      | 70.8   | 75.9   | 77.9 | 79.1  | 79.4  | 79.3    | 78.8       | 75.3     | 66.7      | 58.9      | 72.1  |
| 22      | 59.1     | 62.6      | 70.9   | 75.8   | 77.6 | 79.2  | 79.2  | 79.2    | 78.7       | 75.1     | 66.3      | 58.3      | 71.8  |
| 23      | 58.5     | 62.4      | 70.7   | 75.7   | 77.3 | 79.1  | 79.1  | 79.0    | 78.6       | 75.0     | 66.0      | 57.8      | 71.6  |
| Mean .. | 59.1     | 62.4      | 70.3   | 76.3   | 78.8 | 80.1  | 79.9  | 79.6    | 79.1       | 75.4     | 66.4      | 58.6      | 72.2  |

TABLE VI.  
NORMALS OF RELATIVE HUMIDITY.  
(1901-1920.)

| Hour.   | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Year. |
|---------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------|
| 0       | % 86     | % 84      | % 83   | % 82   | % 83 | % 87  | % 89  | % 90    | % 91       | % 91     | % 89      | % 87      | % 87  |
| 1       | % 87     | % 85      | % 85   | % 83   | % 84 | % 88  | % 90  | % 90    | % 91       | % 91     | % 89      | % 88      | % 87  |
| 2       | % 87     | % 86      | % 86   | % 84   | % 85 | % 88  | % 90  | % 91    | % 91       | % 92     | % 89      | % 88      | % 87  |
| 3       | % 87     | % 86      | % 86   | % 85   | % 86 | % 89  | % 90  | % 91    | % 92       | % 92     | % 89      | % 88      | % 87  |
| 4       | % 87     | % 86      | % 87   | % 85   | % 87 | % 89  | % 91  | % 92    | % 92       | % 92     | % 89      | % 88      | % 87  |
| 5       | % 87     | % 86      | % 87   | % 86   | % 87 | % 89  | % 91  | % 92    | % 92       | % 92     | % 89      | % 88      | % 87  |
| 6       | % 87     | % 86      | % 87   | % 87   | % 87 | % 89  | % 91  | % 92    | % 92       | % 92     | % 89      | % 88      | % 87  |
| 7       | % 87     | % 86      | % 87   | % 85   | % 85 | % 87  | % 89  | % 90    | % 91       | % 92     | % 89      | % 88      | % 87  |
| 8       | % 84     | % 82      | % 81   | % 79   | % 79 | % 81  | % 87  | % 87    | % 87       | % 86     | % 86      | % 80      | % 77  |
| 9       | % 74     | % 80      | % 70   | % 71   | % 73 | % 80  | % 83  | % 84    | % 83       | % 79     | % 72      | % 71      | % 70  |
| 10      | % 64     | % 61      | % 61   | % 65   | % 68 | % 77  | % 81  | % 82    | % 80       | % 74     | % 65      | % 55      | % 66  |
| 11      | % 57     | % 54      | % 54   | % 58   | % 64 | % 71  | % 79  | % 80    | % 78       | % 70     | % 60      | % 52      | % 63  |
| 12      | % 55     | % 51      | % 50   | % 55   | % 61 | % 73  | % 79  | % 79    | % 77       | % 69     | % 58      | % 49      | % 61  |
| 13      | % 51     | % 48      | % 46   | % 51   | % 59 | % 72  | % 77  | % 79    | % 77       | % 68     | % 55      | % 46      | % 59  |
| 14      | % 47     | % 44      | % 42   | % 49   | % 57 | % 71  | % 77  | % 79    | % 76       | % 66     | % 52      | % 45      | % 53  |
| 15      | % 46     | % 42      | % 41   | % 49   | % 57 | % 71  | % 78  | % 80    | % 76       | % 66     | % 52      | % 45      | % 53  |
| 16      | % 47     | % 42      | % 42   | % 50   | % 59 | % 73  | % 79  | % 80    | % 81       | % 66     | % 54      | % 46      | % 60  |
| 17      | % 52     | % 45      | % 46   | % 56   | % 62 | % 75  | % 80  | % 82    | % 81       | % 72     | % 63      | % 55      | % 61  |
| 18      | % 66     | % 57      | % 55   | % 63   | % 67 | % 77  | % 82  | % 84    | % 85       | % 80     | % 74      | % 70      | % 72  |
| 19      | % 74     | % 71      | % 69   | % 73   | % 76 | % 81  | % 86  | % 86    | % 87       | % 84     | % 79      | % 76      | % 77  |
| 20      | % 79     | % 75      | % 75   | % 76   | % 79 | % 83  | % 86  | % 88    | % 88       | % 88     | % 85      | % 80      | % 80  |
| 21      | % 81     | % 78      | % 78   | % 79   | % 80 | % 85  | % 87  | % 88    | % 89       | % 89     | % 86      | % 84      | % 83  |
| 22      | % 83     | % 82      | % 82   | % 81   | % 82 | % 86  | % 88  | % 89    | % 90       | % 90     | % 89      | % 85      | % 86  |
| 23      | % 85     | % 82      | % 82   | % 81   | % 82 | % 86  | % 89  | % 90    | % 90       | % 90     | % 87      | % 85      | % 86  |
| Mean... | 73       | 69        | 68     | 71     | 74   | 81    | 85    | 86      | 86         | 82       | 76        | 72        | 77    |



TABLE VII.  
NORMALS OF ABSOLUTE HUMIDITY.  
(Vapour tension in inches of mercury.)  
(1901-1920.)

| Hour. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Year. |
|-------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------|
| 0     | .454     | .523      | .705   | .834   | .883 | .952  | .964  | .954    | .947       | .845     | .610      | .443      | .759  |
| 1     | .448     | .519      | .697   | .827   | .883 | .950  | .958  | .958    | .946       | .841     | .615      | .435      | .756  |
| 2     | .443     | .515      | .696   | .822   | .884 | .947  | .956  | .954    | .942       | .838     | .600      | .428      | .752  |
| 3     | .437     | .509      | .689   | .818   | .883 | .945  | .952  | .952    | .937       | .835     | .594      | .423      | .748  |
| 4     | .431     | .505      | .683   | .817   | .881 | .944  | .952  | .948    | .934       | .832     | .588      | .417      | .744  |
| 5     | .426     | .497      | .677   | .813   | .883 | .942  | .949  | .945    | .930       | .828     | .576      | .414      | .740  |
| 6     | .422     | .494      | .670   | .815   | .890 | .947  | .949  | .945    | .930       | .826     | .577      | .407      | .739  |
| 7     | .420     | .492      | .677   | .836   | .913 | .962  | .962  | .960    | .952       | .846     | .583      | .407      | .751  |
| 8     | .431     | .500      | .687   | .850   | .927 | .975  | .974  | .965    | .954       | .851     | .595      | .417      | .761  |
| 9     | .431     | .485      | .668   | .840   | .929 | .985  | .979  | .971    | .953       | .831     | .583      | .420      | .756  |
| 10    | .422     | .470      | .635   | .819   | .926 | .987  | .983  | .978    | .956       | .820     | .569      | .417      | .749  |
| 11    | .413     | .450      | .604   | .798   | .923 | .985  | .989  | .984    | .954       | .807     | .554      | .405      | .739  |
| 12    | .407     | .435      | .571   | .776   | .916 | .992  | .996  | .986    | .955       | .802     | .540      | .393      | .731  |
| 13    | .400     | .425      | .556   | .760   | .909 | .992  | .997  | .991    | .946       | .789     | .530      | .385      | .723  |
| 14    | .396     | .419      | .540   | .760   | .907 | .990  | .990  | .990    | .949       | .785     | .529      | .379      | .720  |
| 15    | .393     | .414      | .537   | .756   | .899 | .987  | 1.000 | .991    | .951       | .780     | .526      | .376      | .717  |
| 16    | .397     | .413      | .542   | .758   | .893 | .983  | .999  | .987    | .952       | .784     | .538      | .380      | .719  |
| 17    | .422     | .427      | .564   | .775   | .892 | .981  | .990  | .982    | .955       | .816     | .582      | .425      | .734  |
| 18    | .462     | .481      | .617   | .804   | .896 | .976  | .984  | .978    | .937       | .834     | .610      | .459      | .755  |
| 19    | .473     | .503      | .643   | .812   | .896 | .963  | .974  | .971    | .956       | .844     | .618      | .463      | .760  |
| 20    | .473     | .510      | .665   | .818   | .894 | .956  | .971  | .969    | .956       | .844     | .619      | .463      | .761  |
| 21    | .469     | .516      | .684   | .824   | .893 | .955  | .965  | .965    | .952       | .845     | .617      | .460      | .762  |
| 22    | .465     | .520      | .699   | .833   | .887 | .949  | .966  | .965    | .951       | .844     | .615      | .454      | .762  |
| 23    | .462     | .525      | .705   | .837   | .886 | .950  | .964  | .961    | .950       | .841     | .611      | .448      | .762  |
| Mean  | .433     | .481      | .642   | .808   | .899 | .966  | .974  | .969    | .949       | .825     | .582      | .422      | .746  |

TABLE VIII.  
NORMALS OF RAINFALL.  
(1905-1924.)

| Hour.            | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. |
|------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|
| 1                | 0.02     | 0.19      | 0.15   | 0.06   | 0.15 | 0.36  | 0.47  | 0.68    | 0.17       | 0.10     | 0.02      | 0.01      |
| 2                | 0.02     | 0.07      | 0.07   | 0.08   | 0.10 | 0.47  | 0.43  | 0.55    | 0.21       | 0.19     | 0.01      | 0.01      |
| 3                | 0.02     | 0.05      | 0.05   | 0.02   | 0.13 | 0.52  | 0.43  | 0.57    | 0.39       | 0.20     | 0.02      | 0.02      |
| 4                | 0.01     | 0.03      | 0.02   | 0.05   | 0.04 | 0.38  | 0.53  | 0.43    | 0.20       | 0.15     | 0.04      | 0.01      |
| 5                | 0.02     | 0.03      | 0.05   | 0.01   | 0.03 | 0.46  | 0.59  | 0.66    | 0.26       | 0.21     | 0.04      | 0.00      |
| 6                | 0.01     | 0.09      | 0.03   | 0.00   | 0.05 | 0.54  | 0.67  | 0.56    | 0.39       | 0.22     | 0.02      | 0.01      |
| 7                | 0.04     | 0.01      | 0.03   | 0.00   | 0.04 | 0.46  | 0.68  | 0.49    | 0.48       | 0.13     | 0.02      | 0.00      |
| 8                | 0.01     | 0.05      | 0.01   | 0.00   | 0.03 | 0.39  | 0.50  | 0.61    | 0.37       | 0.10     | 0.01      | 0.01      |
| 9                | 0.00     | 0.02      | 0.05   | 0.01   | 0.07 | 0.43  | 0.38  | 0.27    | 0.38       | 0.14     | 0.01      | 0.01      |
| 10               | 0.01     | 0.02      | 0.02   | 0.01   | 0.03 | 0.50  | 0.62  | 0.60    | 0.42       | 0.15     | 0.05      | 0.01      |
| 11               | 0.00     | 0.02      | 0.02   | 0.08   | 0.05 | 0.52  | 0.42  | 0.39    | 0.71       | 0.27     | 0.01      | 0.01      |
| 12               | 0.00     | 0.02      | 0.02   | 0.00   | 0.07 | 0.59  | 0.64  | 0.56    | 0.50       | 0.28     | 0.00      | 0.00      |
| 13               | 0.00     | 0.02      | 0.03   | 0.01   | 0.15 | 0.64  | 0.75  | 0.90    | 1.01       | 0.32     | 0.01      | 0.01      |
| 14               | 0.01     | 0.02      | 0.02   | 0.03   | 0.07 | 0.68  | 0.74  | 1.14    | 0.42       | 0.27     | 0.01      | 0.01      |
| 15               | 0.01     | 0.03      | 0.02   | 0.04   | 0.23 | 0.83  | 0.85  | 0.82    | 0.56       | 0.38     | 0.06      | 0.00      |
| 16               | 0.00     | 0.05      | 0.04   | 0.05   | 0.44 | 0.59  | 0.80  | 0.86    | 0.28       | 0.64     | 0.01      | 0.00      |
| 17               | 0.01     | 0.05      | 0.09   | 0.12   | 0.33 | 0.69  | 0.77  | 0.65    | 0.45       | 0.17     | 0.04      | 0.00      |
| 18               | 0.01     | 0.11      | 0.12   | 0.19   | 0.39 | 0.73  | 0.63  | 0.50    | 0.37       | 0.31     | 0.02      | 0.00      |
| 19               | 0.00     | 0.07      | 0.24   | 0.30   | 0.80 | 0.57  | 0.44  | 0.24    | 0.23       | 0.24     | 0.01      | 0.00      |
| 20               | 0.02     | 0.12      | 0.10   | 0.13   | 0.53 | 0.65  | 0.88  | 0.27    | 0.23       | 0.15     | 0.01      | 0.00      |
| 21               | 0.02     | 0.05      | 0.11   | 0.19   | 0.53 | 0.50  | 0.51  | 0.42    | 0.23       | 0.10     | 0.01      | 0.00      |
| 22               | 0.05     | 0.03      | 0.17   | 0.32   | 0.39 | 0.58  | 0.51  | 0.41    | 0.22       | 0.12     | 0.00      | 0.00      |
| 23               | 0.01     | 0.05      | 0.06   | 0.12   | 0.19 | 0.46  | 0.47  | 0.36    | 0.13       | 0.16     | 0.01      | 0.00      |
| 24               | 0.05     | 0.04      | 0.05   | 0.11   | 0.18 | 0.43  | 0.27  | 0.37    | 0.13       | 0.09     | 0.02      | 0.01      |
| Month's total .. | 0.36     | 1.28      | 1.57   | 1.93   | 5.02 | 12.87 | 13.97 | 13.64   | 9.10       | 4.73     | 0.46      | 0.13      |

TABLE IX.  
RELATIVE FREQUENCY OF CLOUDS--8 HRS.  
(1901-1920.)

*Number of occasions in a month.*

|           | Cl. | Cl.-St. | Cl.-Cu. | A.-Cu. | A.-St. | Nb.  | Cu.-Nb. | Cu.  | St.-Cu. | St. | Fr.-Cu. | Fr.-Nb. | Fog. | Clear Skies. |
|-----------|-----|---------|---------|--------|--------|------|---------|------|---------|-----|---------|---------|------|--------------|
| January   | 4.6 | 2.2     | 1.0     | 2.1    | 0.2    | 1.5  | 1.4     | 2.3  | 0.7     | 0.6 | 0       | 0       | 1.4  | 18.8         |
| February  | 1.2 | 1.0     | 0.7     | 1.8    | 0.2    | 2.4  | 2.9     | 3.1  | 0.6     | 1.0 | 0.1     | 0.1     | 1.4  | 16.4         |
| March     | 2.8 | 1.5     | 1.2     | 2.1    | 0.3    | 2.1  | 4.5     | 6.6  | 0.7     | 0.6 | 0.6     | 0       | 0.8  | 14.7         |
| April     | 2.1 | 2.0     | 1.2     | 2.7    | 0.3    | 2.5  | 8.6     | 9.8  | 0.2     | 0.2 | 1.7     | 0.1     | 0    | 9.6          |
| May       | 2.5 | 1.8     | 1.7     | 2.7    | 0.5    | 3.7  | 10.9    | 12.6 | 0.3     | 0   | 1.5     | 0.2     | 0    | 5.3          |
| June      | 3.4 | 3.4     | 2.0     | 2.3    | 1.3    | 12.7 | 15.7    | 9.7  | 0.1     | 0.1 | 0.9     | 0.3     | 0    | 1.0          |
| July      | 3.1 | 2.7     | 1.9     | 3.1    | 2.5    | 14.8 | 17.9    | 7.6  | 0.5     | 0.1 | 0.9     | 0.9     | 0    | 0.1          |
| August    | 2.4 | 3.7     | 1.7     | 2.8    | 1.5    | 14.6 | 19.0    | 10.2 | 0.3     | 0   | 0.9     | 0.3     | 0    | 0            |
| September | 5.1 | 5.0     | 1.8     | 2.1    | 1.3    | 9.5  | 15.2    | 11.9 | 0.2     | 0   | 0.7     | 0.3     | 0.1  | 1.2          |
| October   | 3.8 | 3.1     | 1.9     | 2.8    | 0.3    | 4.3  | 6.2     | 7.3  | 0.3     | 0.1 | 0.4     | 0.1     | 0    | 12.1         |
| November  | 5.2 | 2.3     | 0.9     | 2.8    | 0.3    | 1.7  | 2.3     | 2.4  | 0.4     | 0   | 0.1     | 0.1     | 0    | 17.3         |
| December  | 4.8 | 2.5     | 0.9     | 1.7    | 0.1    | 0.7  | 0.9     | 1.9  | 1.1     | 0.1 | 0       | 0.1     | 0.1  | 20.9         |

TABLE X.  
RELATIVE FREQUENCY OF CLOUDS—10 HRS.  
(1901-1920.)

*Number of occasions in a month.*

|              | Ci. | Ci.-St. | Cl.-Cu. | A.-Cu. | A.-St. | Nb.  | Cu.-Nb. | Cu.  | St.-Cu. | St. | Fr.-Cu. | Fr.-Nb. | Fog. | Clear Skies. |
|--------------|-----|---------|---------|--------|--------|------|---------|------|---------|-----|---------|---------|------|--------------|
| January ..   | 3.5 | 2.7     | 0.7     | 1.5    | 0.2    | 1.1  | 2.3     | 3.2  | 0.7     | 0.6 | 0.3     | 0       | 0.3  | 19.6         |
| February ..  | 2.0 | 1.6     | 1.4     | 1.9    | 0.3    | 1.7  | 2.7     | 4.1  | 0.3     | 0.3 | 0.1     | 0.1     | 0.1  | 17.0         |
| March ..     | 2.7 | 2.1     | 0.7     | 1.7    | 0.2    | 1.3  | 5.1     | 7.0  | 0.3     | 0.1 | 0.1     | 0       | 0    | 16.7         |
| April ..     | 2.5 | 2.3     | 1.1     | 1.9    | 0.3    | 1.3  | 5.7     | 10.4 | 0.1     | 0.1 | 0.7     | 0       | 0    | 12.1         |
| May ..       | 2.3 | 1.9     | 1.5     | 1.7    | 0.7    | 3.1  | 10.1    | 14.7 | 0.3     | 0   | 0.8     | 0.2     | 0    | 6.9          |
| June ..      | 2.7 | 2.9     | 0.9     | 1.7    | 2.3    | 11.3 | 16.3    | 12.1 | 0.1     | 0.2 | 0.5     | 0.3     | 0    | 1.5          |
| July ..      | 2.8 | 2.5     | 1.0     | 1.9    | 2.9    | 13.3 | 18.9    | 10.5 | 0.5     | 0   | 0.5     | 5.5     | 0    | 0.1          |
| August ..    | 2.0 | 3.9     | 0.9     | 1.2    | 2.1    | 12.7 | 20.1    | 13.7 | 0.1     | 0   | 0.9     | 0.1     | 0    | 0            |
| September .. | 3.5 | 4.5     | 1.2     | 1.5    | 1.5    | 8.7  | 17.4    | 15.9 | 0.3     | 0   | 0.3     | 0.1     | 0    | 1.7          |
| October ..   | 3.1 | 2.5     | 1.3     | 1.7    | 0.5    | 4.6  | 9.5     | 13.5 | 0.1     | 0.1 | 0.1     | 0.1     | 0    | 7.5          |
| November ..  | 3.7 | 3.0     | 1.1     | 1.8    | 0.2    | 1.3  | 2.9     | 4.5  | 0.2     | 1.0 | 0.1     | 0.1     | 0    | 16.7         |
| December ..  | 4.7 | 2.8     | 0.7     | 1.3    | 0.1    | 0.5  | 0.7     | 2.3  | 0.8     | 0.1 | 0       | 0       | 0.1  | 21.3         |

TABLE XI.  
RELATIVE FREQUENCY OF CLOUDS—16 HRS.  
(1901-1920.)

*Number of occasions in a month.*

|              | Ci. | Ci.-Stk. | Ci.-Cu. | A.-Cu. | A.-Stk. | Nb.  | Cu.-Nb. | Cu.  | St.-Cu. | St. | Fr.-Cu. | Fr.-Nb. | Fog. | Clear Skies. |
|--------------|-----|----------|---------|--------|---------|------|---------|------|---------|-----|---------|---------|------|--------------|
| January ..   | 5.6 | 3.2      | 0.7     | 1.2    | 0.3     | 1.4  | 2.6     | 5.4  | 0.6     | 0.1 | 0       | 0.1     | 0    | 16.8         |
| February ..  | 2.8 | 2.2      | 1.3     | 1.3    | 0.2     | 1.8  | 3.9     | 8.1  | 0.2     | 0   | 0       | 0.1     | 0    | 13.7         |
| March ..     | 4.2 | 3.2      | 1.0     | 1.5    | 0.5     | 2.3  | 4.5     | 8.9  | 0.2     | 0   | 0       | 0       | 0    | 13.7         |
| April ..     | 4.3 | 3.8      | 0.6     | 0.9    | 0.8     | 2.5  | 7.3     | 11.2 | 0       | 0   | 0.1     | 0       | 0    | 10.4         |
| May ..       | 4.1 | 3.9      | 0.9     | 0.5    | 1.1     | 4.6  | 10.5    | 14.4 | 0.1     | 0   | 0.1     | 0.1     | 0    | 6.5          |
| June ..      | 3.9 | 3.9      | 0.4     | 0.8    | 4.1     | 12.8 | 14.9    | 10.2 | 0.1     | 0.1 | 0.5     | 0.7     | 0    | 1.1          |
| July ..      | 3.0 | 5.3      | 0.5     | 0.7    | 3.5     | 15.8 | 19.0    | 10.1 | 0.5     | 0   | 0.3     | 0.5     | 0    | 0            |
| August ..    | 3.7 | 6.1      | 0.9     | 0.7    | 3.5     | 15.3 | 19.7    | 11.1 | 0.5     | 0   | 0.3     | 0.4     | 0    | 0.1          |
| September .. | 4.7 | 6.5      | 0.9     | 0.6    | 2.5     | 13.1 | 17.0    | 12.0 | 0.3     | 0   | 0.3     | 0.5     | 0    | 0.4          |
| October ..   | 4.1 | 5.2      | 0.9     | 0.9    | 0.7     | 6.4  | 12.0    | 13.0 | 0.1     | 0   | 0       | 0.1     | 0    | 6.2          |
| November ..  | 4.6 | 3.1      | 1.1     | 1.8    | 0.3     | 2.1  | 4.8     | 7.5  | 0.3     | 0.1 | 0       | 0.1     | 0    | 12.9         |
| December ..  | 6.7 | 3.2      | 0.9     | 1.6    | 0.1     | 0.7  | 1.7     | 3.5  | 0.9     | 0   | 0       | 0.1     | 0    | 17.9         |

TABLE XII.  
 NORMALS OF CLOUD AMOUNT.  
 (1901-1920.)  
 Whole Sky, 10·0.

| Month.    |    |    | 8 hrs. | 10 hrs. | 16 hrs. |
|-----------|----|----|--------|---------|---------|
| January   | .. | .. | 2·4    | 2·1     | 2·3     |
| February  | .. | .. | 2·7    | 2·2     | 2·4     |
| March     | .. | .. | 2·9    | 2·3     | 2·7     |
| April     | .. | .. | 3·7    | 2·9     | 3·2     |
| May       | .. | .. | 4·7    | 4·3     | 4·2     |
| June      | .. | .. | 7·5    | 7·5     | 7·6     |
| July      | .. | .. | 8·6    | 8·5     | 8·8     |
| August    | .. | .. | 8·5    | 8·4     | 8·7     |
| September | .. | .. | 6·9    | 7·1     | 7·9     |
| October   | .. | .. | 3·7    | 4·3     | 4·7     |
| November  | .. | .. | 2·2    | 2·1     | 2·8     |
| December  | .. | .. | 1·6    | 1·5     | 1·9     |

TABLE XIII.  
 NORMALS OF HOURS OF BRIGHT SUNSHINE.\*  
 (1889-1908.)

| Hour.    | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. |
|----------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|
| 6        | 0·0      | 0·0       | 0·0    | 0·0    | 0·0  | 0·0   | 0·0   | 0·0     | 0·0        | 0·0      | 0·0       | 0·0       |
| 7        | 0·0      | 0·0       | 0·0    | 0·1    | 0·1  | 0·1   | 0·1   | 0·1     | 0·0        | 0·1      | 0·0       | 0·0       |
| 8        | 0·3      | 0·3       | 0·2    | 0·3    | 0·5  | 0·3   | 0·3   | 0·3     | 0·3        | 0·5      | 0·5       | 0·4       |
| 9        | 0·8      | 0·7       | 0·7    | 0·7    | 0·7  | 0·4   | 0·3   | 0·4     | 0·5        | 0·7      | 0·9       | 0·9       |
| 10       | 0·9      | 0·9       | 0·9    | 0·9    | 0·8  | 0·5   | 0·4   | 0·5     | 0·5        | 0·8      | 0·9       | 0·9       |
| 11       | 0·9      | 0·9       | 0·9    | 0·9    | 0·9  | 0·5   | 0·4   | 0·5     | 0·6        | 0·8      | 0·9       | 0·9       |
| 12       | 0·9      | 0·9       | 0·9    | 0·9    | 0·9  | 0·3   | 0·4   | 0·5     | 0·6        | 0·7      | 0·9       | 0·9       |
| 13       | 0·9      | 0·9       | 0·9    | 0·9    | 0·9  | 0·5   | 0·3   | 0·4     | 0·5        | 0·7      | 0·9       | 0·9       |
| 14       | 0·9      | 0·9       | 0·9    | 0·9    | 0·9  | 0·5   | 0·3   | 0·3     | 0·5        | 0·7      | 0·9       | 0·9       |
| 15       | 0·9      | 0·9       | 0·9    | 0·9    | 0·8  | 0·4   | 0·3   | 0·3     | 0·4        | 0·7      | 0·9       | 0·9       |
| 16       | 0·9      | 0·9       | 0·9    | 0·9    | 0·7  | 0·4   | 0·3   | 0·3     | 0·3        | 0·7      | 0·9       | 0·9       |
| 17       | 0·3      | 0·5       | 0·5    | 0·5    | 0·5  | 0·3   | 0·2   | 0·2     | 0·3        | 0·5      | 0·3       | 0·3       |
| 18       | 0·0      | 0·1       | 0·1    | 0·1    | 0·2  | 0·1   | 0·1   | 0·1     | 0·1        | 0·1      | 0·0       | 0·0       |
| 19       | 0·0      | 0·0       | 0·0    | 0·0    | 0·0  | 0·0   | 0·0   | 0·0     | 0·0        | 0·0      | 0·0       | 0·0       |
| TOTAL .. | 7·7      | 7·9       | 7·8    | 8·0    | 7·9  | 4·5   | 3·4   | 3·9     | 4·6        | 7·0      | 8·0       | 7·9       |

\* Reliance cannot be placed on values of hours 6, 7, 8 and 17, 18, 19, because drawbacks in situation and exposure of the instrument, i.e., the presence of trees in the vicinity, have undoubtedly vitiated the results, to varying extent in different months, according to sunrise and sunset times.

TABLE XIV.

## NORMALS OF WIND VELOCITY.

*Miles per hour.*

(1901-1920.)

| Hour.   | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Year. |
|---------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|-------|
| 1       | 1.1      | 1.7       | 2.7    | 4.0    | 3.7  | 3.3   | 3.0   | 2.5     | 1.8        | 1.1      | 1.1       | 1.0       | 2.3   |
| 2       | 1.2      | 1.7       | 2.5    | 3.7    | 3.5  | 3.1   | 2.9   | 2.5     | 1.7        | 1.2      | 1.1       | 1.2       | 2.2   |
| 3       | 1.3      | 1.6       | 2.4    | 3.4    | 3.1  | 3.1   | 2.8   | 2.4     | 1.8        | 1.1      | 1.2       | 1.2       | 2.1   |
| 4       | 1.4      | 1.7       | 2.4    | 3.3    | 3.1  | 3.0   | 2.8   | 2.4     | 1.8        | 1.2      | 1.2       | 1.4       | 2.1   |
| 5       | 1.5      | 1.7       | 2.3    | 3.1    | 2.9  | 2.9   | 2.8   | 2.4     | 1.7        | 1.2      | 1.4       | 1.4       | 2.1   |
| 6       | 1.3      | 1.7       | 2.2    | 2.9    | 2.8  | 2.9   | 2.8   | 2.3     | 1.7        | 1.2      | 1.3       | 1.4       | 2.0   |
| 7       | 1.2      | 1.7       | 2.2    | 3.2    | 3.4  | 3.4   | 3.3   | 2.6     | 2.0        | 1.3      | 1.4       | 1.4       | 2.3   |
| 8       | 1.5      | 1.9       | 2.8    | 4.6    | 4.7  | 4.4   | 4.2   | 3.7     | 3.1        | 2.2      | 1.9       | 1.7       | 3.1   |
| 9       | 2.1      | 2.8       | 4.1    | 5.5    | 5.5  | 5.0   | 4.8   | 4.3     | 3.8        | 2.9      | 2.6       | 2.3       | 3.8   |
| 10      | 3.1      | 3.9       | 5.0    | 6.0    | 5.8  | 5.4   | 5.3   | 4.7     | 4.2        | 3.4      | 3.3       | 3.1       | 4.4   |
| 11      | 3.8      | 4.7       | 5.3    | 6.2    | 6.3  | 5.5   | 5.4   | 4.9     | 4.4        | 3.7      | 3.9       | 3.9       | 4.8   |
| 12      | 4.2      | 5.0       | 5.5    | 6.3    | 6.4  | 5.8   | 5.7   | 5.1     | 4.7        | 4.1      | 4.3       | 4.5       | 5.1   |
| 13      | 4.3      | 4.9       | 5.3    | 6.1    | 6.1  | 5.8   | 5.6   | 5.0     | 4.6        | 4.1      | 4.2       | 4.5       | 5.0   |
| 14      | 4.4      | 4.9       | 5.3    | 6.1    | 6.1  | 5.6   | 5.4   | 4.8     | 4.4        | 3.9      | 4.2       | 4.5       | 5.0   |
| 15      | 4.4      | 5.0       | 5.3    | 6.1    | 6.3  | 5.5   | 5.3   | 4.5     | 4.2        | 3.9      | 4.1       | 4.5       | 4.9   |
| 16      | 4.2      | 4.7       | 5.4    | 6.3    | 6.3  | 5.6   | 5.0   | 4.5     | 4.0        | 3.6      | 3.7       | 4.1       | 4.8   |
| 17      | 3.1      | 4.1       | 4.7    | 5.9    | 6.0  | 5.1   | 4.6   | 3.9     | 3.5        | 2.8      | 2.5       | 2.8       | 4.1   |
| 18      | 1.5      | 2.6       | 3.6    | 5.5    | 5.6  | 4.7   | 4.1   | 3.5     | 2.6        | 1.6      | 1.2       | 1.0       | 3.1   |
| 19      | 0.9      | 1.7       | 3.0    | 5.3    | 5.3  | 4.3   | 3.6   | 2.9     | 2.0        | 1.2      | 0.9       | 0.7       | 2.7   |
| 20      | 0.9      | 1.7       | 3.1    | 5.3    | 5.0  | 4.0   | 3.3   | 2.8     | 2.0        | 1.2      | 0.9       | 0.7       | 2.6   |
| 21      | 1.0      | 1.8       | 3.1    | 4.9    | 4.7  | 3.9   | 3.2   | 2.6     | 1.9        | 1.2      | 0.9       | 0.7       | 2.5   |
| 22      | 1.1      | 1.8       | 3.1    | 4.7    | 4.5  | 3.7   | 3.1   | 2.7     | 2.0        | 1.2      | 0.9       | 0.8       | 2.5   |
| 23      | 1.1      | 1.8       | 3.1    | 4.5    | 4.4  | 3.4   | 3.0   | 2.5     | 1.9        | 1.2      | 0.9       | 0.9       | 2.4   |
| 24      | 1.1      | 1.7       | 2.9    | 4.2    | 4.0  | 3.4   | 3.0   | 2.5     | 1.8        | 1.1      | 0.9       | 0.9       | 2.3   |
| Mean .. | 2.2      | 2.8       | 3.6    | 4.9    | 4.8  | 4.3   | 4.0   | 3.4     | 2.8        | 2.1      | 2.1       | 2.1       | 3.3   |

TABLE XV.  
NORMALS OF WIND DIRECTION.  
(1901-1920.)

| Hour. | January. | February. | March. | April. | May.   | June. | July.  | August. | Septem-ber. | October. | Novem-ber. | Decem-ber. |
|-------|----------|-----------|--------|--------|--------|-------|--------|---------|-------------|----------|------------|------------|
| 1     | N 28°W   | N 35°W    | S 38°W | S 16°W | S 5°E  | S 4°E | S 9°W  | S 4°W   | S 1°W       | N 65°W   | N 1°W      | N 11°W     |
| 2     | N 26°W   | N 71°W    | S 42°W | S 19°W | S 2°E  | S 1°E | S 8°W  | S 6°W   | S 2°W       | N 47°W   | N 2°W      | N 13°W     |
| 3     | N 24°W   | N 66°W    | S 45°W | S 20°W | S 1°E  | S 1°E | S 7°W  | S 6°W   | S 2°W       | N 68°W   | N 2°W      | N 11°W     |
| 4     | N 22°W   | N 61°W    | S 48°W | S 21°W | S 1°E  | S 1°E | S 11°W | S 5°W   | S 2°E       | N 52°W   | N 1°W      | N 11°W     |
| 5     | N 22°W   | N 59°W    | S 51°W | S 22°W | S 1°E  | S 1°E | S 9°W  | S 4°W   | S 2°E       | N 43°W   | N 1°W      | N 8°W      |
| 6     | N 19°W   | N 51°W    | S 56°W | S 23°W | S 1°E  | S 1°E | S 9°W  | S 4°W   | S 3°E       | N 32°W   | N 1°W      | N 8°W      |
| 7     | N 18°W   | N 46°W    | S 55°W | S 22°W | S 2°E  | S 5°E | S 7°W  | S 3°E   | S 1°W       | N 28°W   | N 2°W      | N 8°W      |
| 8     | N 16°W   | N 41°W    | S 56°W | S 25°W | S 6°W  | S 4°E | S 8°W  | S 3°E   | S 2°W       | N 20°W   | N 3°W      | N 8°W      |
| 9     | N 15°W   | N 39°W    | S 63°W | S 30°W | S 10°W | S 4°E | S 10°W | S 5°E   | S 2°W       | N 27°W   | N 3°W      | N 7°W      |
| 10    | N 11°W   | N 41°W    | S 72°W | S 34°W | S 12°W | S 2°W | S 8°W  | S 2°E   | S 1°E       | N 26°W   | N 3°E      | N 4°W      |
| 11    | N 7°W    | N 40°W    | S 77°W | S 38°W | S 14°W | S 5°W | S 10°W | S 1°E   | S 2°E       | N 27°W   | N 7°W      | N 8°W      |
| 12    | N 11°W   | N 49°W    | S 86°W | S 40°W | S 13°W | S 2°W | S 9°W  | S 2°W   | S 3°E       | N 30°W   | N 10°W     | N 14°W     |
| 13    | N 24°W   | N 63°W    | S 80°W | S 35°W | S 11°W | S 1°E | S 5°W  | S 1°W   | S 3°E       | N 35°W   | N 13°W     | N 18°W     |
| 14    | N 34°W   | N 66°W    | S 74°W | S 31°W | S 9°W  | S 2°E | S 3°W  | S 3°E   | S 5°E       | N 44°W   | N 12°W     | N 17°W     |
| 15    | N 36°W   | N 66°W    | S 70°W | S 26°W | S 8°W  | S 2°E | S 3°W  | S 3°E   | S 1°E       | N 32°W   | N 8°W      | N 14°W     |
| 16    | N 35°W   | N 71°W    | S 67°W | S 25°W | S 4°W  | S 5°E | S 4°W  | S 3°E   | S 3°W       | N 38°W   | N 3°W      | N 12°W     |
| 17    | N 34°W   | N 61°W    | S 63°W | S 23°W | S 1°E  | S 4°E | S 6°W  | S 1°E   | S 7°W       | N 55°W   | N 2°W      | N 12°W     |
| 18    | N 29°W   | N 60°W    | S 64°W | S 16°W | S 1°E  | S 3°E | S 7°W  | S 4°W   | S 6°W       | N 53°W   | N 3°W      | N 11°W     |
| 19    | N 31°W   | N 77°W    | S 44°W | S 12°W | S 2°E  | S 4°E | S 4°W  | S 3°W   | S 3°W       | N 79°W   | N 3°W      | N 13°W     |
| 20    | N 33°W   | N 82°W    | S 35°W | S 9°W  | S 5°E  | S 3°E | S 6°W  | S 3°W   | S 2°W       | N 71°W   | N 3°W      | N 10°W     |
| 21    | N 32°W   | N 88°W    | S 34°W | S 10°W | S 6°E  | S 4°E | S 5°W  | S 3°W   | S 1°W       | N 61°W   | N 2°W      | N 11°W     |
| 22    | N 33°W   | N 88°W    | S 33°W | S 10°W | S 5°E  | S 5°E | S 6°W  | S 3°W   | S 4°W       | N 71°W   | N 3°W      | N 11°W     |
| 23    | N 33°W   | N 88°W    | S 34°W | S 13°W | S 6°E  | S 5°E | S 6°W  | S 4°W   | S 4°W       | N 71°W   | N 3°W      | N 11°W     |
| 24    | N 29°W   | N 88°W    | S 34°W | S 13°W | S 6°E  | S 5°E | S 6°W  | S 4°W   | S 4°W       | N 71°W   | N 3°W      | N 11°W     |



TABLE XVI.

PERCENTAGE FREQUENCY OF WIND DIRECTION : JANUARY.  
(1901-1920.)

| Hour.   | N.   | NE.  | E.  | SE. | S.  | SW.  | W.   | NW.  | Calm. |
|---------|------|------|-----|-----|-----|------|------|------|-------|
| 1       | 31.9 | 3.6  | 2.6 | 2.0 | 3.0 | 7.6  | 8.9  | 15.8 | 24.7  |
| 2       | 33.1 | 4.6  | 2.0 | 2.0 | 2.3 | 7.3  | 8.6  | 17.2 | 22.8  |
| 3       | 34.5 | 4.9  | 2.6 | 1.6 | 2.3 | 6.9  | 8.9  | 17.4 | 20.8  |
| 4       | 37.1 | 6.0  | 2.0 | 1.7 | 2.3 | 6.0  | 9.3  | 18.2 | 17.5  |
| 5       | 36.0 | 6.6  | 1.7 | 2.3 | 2.3 | 6.3  | 9.2  | 18.2 | 17.5  |
| 6       | 36.7 | 7.0  | 1.7 | 2.0 | 2.0 | 6.0  | 7.9  | 16.8 | 20.1  |
| 7       | 36.7 | 7.3  | 2.3 | 1.7 | 2.0 | 5.6  | 8.3  | 15.5 | 20.8  |
| 8       | 37.0 | 8.3  | 2.7 | 1.7 | 2.0 | 5.3  | 7.3  | 17.2 | 18.8  |
| 9       | 41.4 | 9.5  | 3.6 | 1.6 | 2.9 | 6.2  | 7.8  | 18.3 | 8.8   |
| 10      | 42.6 | 11.6 | 6.6 | 1.7 | 1.7 | 6.3  | 9.3  | 18.2 | 2.3   |
| 11      | 42.4 | 11.9 | 9.0 | 1.7 | 2.3 | 6.6  | 9.0  | 16.9 | 0.3   |
| 12      | 39.0 | 10.3 | 9.3 | 2.3 | 3.0 | 8.0  | 9.0  | 18.7 | 0.3   |
| 13      | 37.9 | 6.4  | 7.1 | 2.4 | 1.7 | 9.4  | 11.8 | 23.2 | 0.3   |
| 14      | 33.9 | 4.7  | 5.0 | 2.7 | 2.0 | 10.3 | 14.6 | 26.9 | 0.0   |
| 15      | 33.3 | 4.0  | 4.0 | 3.0 | 2.6 | 7.9  | 16.2 | 28.7 | 0.3   |
| 16      | 33.3 | 3.6  | 4.3 | 2.3 | 4.3 | 6.9  | 15.5 | 29.0 | 0.7   |
| 17      | 35.2 | 4.3  | 3.7 | 1.6 | 4.0 | 7.0  | 15.3 | 26.6 | 2.3   |
| 18      | 35.2 | 4.0  | 2.7 | 1.6 | 3.7 | 6.6  | 12.0 | 19.9 | 14.3  |
| 19      | 27.4 | 3.3  | 3.0 | 1.3 | 3.3 | 6.3  | 9.9  | 15.5 | 30.0  |
| 20      | 25.5 | 3.3  | 2.6 | 1.7 | 4.0 | 7.0  | 9.6  | 14.3 | 32.1  |
| 21      | 26.1 | 4.3  | 2.6 | 1.7 | 3.6 | 7.6  | 9.3  | 14.2 | 30.7  |
| 22      | 28.1 | 4.0  | 2.6 | 2.3 | 3.7 | 7.9  | 10.9 | 14.3 | 26.1  |
| 23      | 28.3 | 3.7  | 3.0 | 2.0 | 3.3 | 7.7  | 11.3 | 16.3 | 24.3  |
| 24      | 29.9 | 4.0  | 3.7 | 2.3 | 3.0 | 8.0  | 10.3 | 15.3 | 23.6  |
| Mean .. | 34.3 | 5.9  | 3.8 | 2.0 | 2.8 | 7.1  | 10.4 | 18.9 | 15.0  |

TABLE XVII.

PERCENTAGE FREQUENCY OF WIND DIRECTION : FEBRUARY.  
(1901-1920.)

| HOOR.   | N.   | NE.  | E.  | SE. | S.   | SW.  | W.   | NW.  | Calm. |
|---------|------|------|-----|-----|------|------|------|------|-------|
| 1       | 17.4 | 4.0  | 6.2 | 3.6 | 10.1 | 20.7 | 13.8 | 13.1 | 11.3  |
| 2       | 19.3 | 4.7  | 6.5 | 3.3 | 8.9  | 19.0 | 12.5 | 14.7 | 11.1  |
| 3       | 21.5 | 4.3  | 5.0 | 2.9 | 9.3  | 18.3 | 11.1 | 15.4 | 12.2  |
| 4       | 21.9 | 5.4  | 4.3 | 2.5 | 8.2  | 18.3 | 11.1 | 15.1 | 13.3  |
| 5       | 23.7 | 5.4  | 4.3 | 2.5 | 7.9  | 18.3 | 12.2 | 14.7 | 11.1  |
| 6       | 24.7 | 6.1  | 4.7 | 1.8 | 8.2  | 16.8 | 9.7  | 13.9 | 14.3  |
| 7       | 24.1 | 6.8  | 4.7 | 1.8 | 7.2  | 15.5 | 10.1 | 15.1 | 14.7  |
| 8       | 24.8 | 7.9  | 4.7 | 1.8 | 6.8  | 15.1 | 9.7  | 15.8 | 13.3  |
| 9       | 25.8 | 9.7  | 6.8 | 2.5 | 6.8  | 16.5 | 11.8 | 15.4 | 4.7   |
| 10      | 23.0 | 12.8 | 7.7 | 4.0 | 4.8  | 17.9 | 15.3 | 14.2 | 0.4   |
| 11      | 24.9 | 9.7  | 9.0 | 4.0 | 4.3  | 17.0 | 15.5 | 15.2 | 0.4   |
| 12      | 23.5 | 6.9  | 9.0 | 3.6 | 5.4  | 17.0 | 16.2 | 18.4 | 0.0   |
| 13      | 20.4 | 6.1  | 6.8 | 3.2 | 5.4  | 17.6 | 18.7 | 21.9 | 0.0   |
| 14      | 19.0 | 4.7  | 5.7 | 2.9 | 4.7  | 17.6 | 21.5 | 24.0 | 0.0   |
| 15      | 16.2 | 5.0  | 5.0 | 2.2 | 5.4  | 16.6 | 23.8 | 25.6 | 0.4   |
| 16      | 15.1 | 3.6  | 5.4 | 2.5 | 7.2  | 16.9 | 22.7 | 26.3 | 0.4   |
| 17      | 18.4 | 4.3  | 5.4 | 2.5 | 7.6  | 15.5 | 23.1 | 22.8 | 0.4   |
| 18      | 20.5 | 4.7  | 4.7 | 1.8 | 7.6  | 14.8 | 20.5 | 22.7 | 2.9   |
| 19      | 17.5 | 3.9  | 3.9 | 1.8 | 7.8  | 16.0 | 16.4 | 17.5 | 15.3  |
| 20      | 15.7 | 4.7  | 3.9 | 2.5 | 8.2  | 18.9 | 15.0 | 15.7 | 15.4  |
| 21      | 15.3 | 4.6  | 5.0 | 2.5 | 9.6  | 19.9 | 12.5 | 15.0 | 15.7  |
| 22      | 15.8 | 4.3  | 5.4 | 2.9 | 10.4 | 22.0 | 13.3 | 12.6 | 13.3  |
| 23      | 16.2 | 4.7  | 5.4 | 2.9 | 11.2 | 21.6 | 13.7 | 14.0 | 10.4  |
| 24      | 16.4 | 4.7  | 5.4 | 3.2 | 11.1 | 21.4 | 13.6 | 13.9 | 10.4  |
| Mean .. | 20.0 | 5.8  | 5.6 | 2.7 | 7.7  | 17.9 | 15.2 | 17.2 | 8.0   |

TABLE XVIII.

PERCENTAGE FREQUENCY OF WIND DIRECTION : MARCH.

(1901-1920.)

| HOUR.   | N.   | NE. | E.  | SE. | S.   | SW.  | W.   | NW.  | Calm. |
|---------|------|-----|-----|-----|------|------|------|------|-------|
| 1       | 5.5  | 2.9 | 2.9 | 6.5 | 22.3 | 37.7 | 9.7  | 7.4  | 5.1   |
| 2       | 6.1  | 1.9 | 3.5 | 6.1 | 20.3 | 37.7 | 10.7 | 8.1  | 5.5   |
| 3       | 7.4  | 1.6 | 3.5 | 5.8 | 19.7 | 36.4 | 10.0 | 10.3 | 5.2   |
| 4       | 7.1  | 1.9 | 3.5 | 4.9 | 18.7 | 35.5 | 11.0 | 10.3 | 7.1   |
| 5       | 8.1  | 2.3 | 3.2 | 5.8 | 16.1 | 33.9 | 10.0 | 11.3 | 9.4   |
| 6       | 8.4  | 2.3 | 2.6 | 5.8 | 14.3 | 32.1 | 11.0 | 12.0 | 11.6  |
| 7       | 8.7  | 2.9 | 2.9 | 5.5 | 14.9 | 31.3 | 11.3 | 10.7 | 11.9  |
| 8       | 10.7 | 2.6 | 3.6 | 6.2 | 15.2 | 32.2 | 10.7 | 12.0 | 6.8   |
| 9       | 10.3 | 4.5 | 3.2 | 5.5 | 13.2 | 35.2 | 12.9 | 13.5 | 1.6   |
| 10      | 12.6 | 4.2 | 3.9 | 3.2 | 11.0 | 35.3 | 15.9 | 13.6 | 0.3   |
| 11      | 12.9 | 4.9 | 5.2 | 3.2 | 10.0 | 32.4 | 17.2 | 14.3 | 0.0   |
| 12      | 14.2 | 4.9 | 5.5 | 2.9 | 9.4  | 28.1 | 19.7 | 15.2 | 0.3   |
| 13      | 12.0 | 3.2 | 4.9 | 3.6 | 10.0 | 27.8 | 21.7 | 16.8 | 0.0   |
| 14      | 10.6 | 3.2 | 2.9 | 3.6 | 11.9 | 27.0 | 23.5 | 17.1 | 0.3   |
| 15      | 7.1  | 2.9 | 4.2 | 3.9 | 13.0 | 25.6 | 27.2 | 15.9 | 0.3   |
| 16      | 6.2  | 2.3 | 3.6 | 4.2 | 16.6 | 23.7 | 26.6 | 16.6 | 0.3   |
| 17      | 6.8  | 1.9 | 3.9 | 4.2 | 19.0 | 22.9 | 24.9 | 16.1 | 0.3   |
| 18      | 8.4  | 1.9 | 2.9 | 4.2 | 21.3 | 22.9 | 20.7 | 14.9 | 2.9   |
| 19      | 8.1  | 1.9 | 3.6 | 4.2 | 22.3 | 24.9 | 15.9 | 12.3 | 6.8   |
| 20      | 7.2  | 2.3 | 3.6 | 4.2 | 26.3 | 26.0 | 12.0 | 11.1 | 7.5   |
| 21      | 5.8  | 2.3 | 3.9 | 5.2 | 28.7 | 28.7 | 10.3 | 8.4  | 6.8   |
| 22      | 5.5  | 1.9 | 4.2 | 5.5 | 28.4 | 33.2 | 8.7  | 9.0  | 3.6   |
| 23      | 6.1  | 2.3 | 3.9 | 6.1 | 28.0 | 34.7 | 8.4  | 7.1  | 3.6   |
| 24      | 5.5  | 2.3 | 2.9 | 6.2 | 25.9 | 37.9 | 8.4  | 6.2  | 4.9   |
| Mean .. | 8.4  | 2.7 | 3.7 | 4.9 | 18.2 | 31.0 | 14.9 | 12.1 | 4.3   |

TABLE XIX.  
PERCENTAGE FREQUENCY OF WIND DIRECTION: APRIL.  
(1901-1920.)

| Hour.   | N.  | NE. | E.  | SE.  | S.   | SW.  | W.   | NW. | Calm. |
|---------|-----|-----|-----|------|------|------|------|-----|-------|
| 1       | 1.7 | 1.7 | 4.3 | 11.3 | 35.6 | 37.6 | 4.3  | 2.0 | 1.7   |
| 2       | 1.7 | 1.3 | 3.7 | 10.7 | 34.0 | 39.7 | 5.0  | 2.3 | 1.7   |
| 3       | 1.3 | 1.0 | 3.7 | 10.7 | 32.3 | 41.0 | 5.3  | 2.0 | 2.7   |
| 4       | 1.3 | 1.7 | 4.3 | 9.7  | 29.9 | 41.9 | 5.7  | 2.0 | 3.7   |
| 5       | 1.7 | 1.4 | 4.4 | 9.4  | 30.1 | 40.5 | 6.4  | 2.0 | 4.0   |
| 6       | 1.0 | 1.3 | 4.3 | 10.3 | 29.3 | 41.0 | 6.0  | 3.0 | 3.7   |
| 7       | 1.0 | 1.4 | 4.4 | 10.7 | 29.4 | 40.8 | 6.0  | 3.4 | 3.0   |
| 8       | 1.7 | 1.7 | 4.0 | 9.1  | 29.2 | 44.0 | 6.4  | 3.7 | 0.4   |
| 9       | 1.7 | 1.7 | 3.0 | 6.7  | 27.8 | 47.8 | 7.7  | 3.7 | 0.0   |
| 10      | 2.3 | 1.0 | 3.0 | 5.0  | 26.9 | 46.9 | 10.3 | 4.3 | 0.3   |
| 11      | 3.0 | 1.0 | 2.7 | 5.0  | 25.3 | 44.7 | 12.0 | 6.3 | 0.0   |
| 12      | 4.0 | 1.0 | 3.0 | 4.0  | 27.1 | 39.8 | 14.1 | 7.0 | 0.0   |
| 13      | 3.0 | 1.0 | 2.3 | 3.7  | 30.0 | 37.0 | 16.7 | 6.3 | 0.0   |
| 14      | 3.0 | 1.0 | 3.0 | 4.4  | 32.8 | 35.1 | 15.7 | 5.0 | 0.0   |
| 15      | 2.0 | 0.7 | 3.0 | 5.7  | 35.1 | 34.8 | 14.4 | 4.4 | 0.0   |
| 16      | 1.7 | 0.7 | 3.3 | 6.3  | 39.3 | 31.0 | 12.7 | 5.0 | 0.0   |
| 17      | 2.0 | 0.7 | 2.7 | 5.7  | 41.8 | 31.5 | 10.7 | 5.0 | 0.0   |
| 18      | 3.0 | 1.0 | 2.7 | 6.1  | 44.0 | 28.5 | 8.4  | 5.0 | 1.4   |
| 19      | 1.7 | 1.0 | 3.7 | 7.7  | 45.8 | 28.4 | 6.7  | 3.7 | 1.8   |
| 20      | 2.7 | 2.0 | 4.0 | 10.4 | 45.2 | 26.8 | 5.0  | 3.4 | 0.7   |
| 21      | 1.7 | 1.4 | 6.4 | 9.8  | 46.5 | 27.3 | 4.4  | 2.4 | 0.4   |
| 22      | 1.7 | 1.3 | 7.0 | 10.3 | 44.3 | 28.7 | 3.3  | 2.7 | 0.7   |
| 23      | 2.3 | 1.0 | 6.0 | 12.0 | 41.7 | 31.0 | 3.3  | 2.3 | 0.3   |
| 24      | 2.0 | 1.7 | 5.0 | 12.4 | 37.1 | 35.1 | 3.7  | 2.4 | 0.7   |
| Mean .. | 2.1 | 1.2 | 3.9 | 8.2  | 35.0 | 36.7 | 8.1  | 3.7 | 1.1   |

TABLE XX.  
PERCENTAGE FREQUENCY OF WIND DIRECTION: MAY.  
(1901-1920.)

| Hour.   | N.  | NE. | E.   | SE.  | S.   | SW.  | W.  | NW. | Calm. |
|---------|-----|-----|------|------|------|------|-----|-----|-------|
| 1       | 2.0 | 3.0 | 8.9  | 20.5 | 35.8 | 22.5 | 2.7 | 2.3 | 2.3   |
| 2       | 1.3 | 3.0 | 7.2  | 21.7 | 33.9 | 24.0 | 3.9 | 1.6 | 3.3   |
| 3       | 1.6 | 3.0 | 7.2  | 19.4 | 33.6 | 24.4 | 3.6 | 2.3 | 4.9   |
| 4       | 2.0 | 2.3 | 7.9  | 20.2 | 32.5 | 25.8 | 3.7 | 2.0 | 3.6   |
| 5       | 2.0 | 2.9 | 7.2  | 20.0 | 32.5 | 24.9 | 3.6 | 2.3 | 4.6   |
| 6       | 2.3 | 2.9 | 6.9  | 20.0 | 30.5 | 25.3 | 3.6 | 2.9 | 5.6   |
| 7       | 2.7 | 3.7 | 9.4  | 18.5 | 33.2 | 24.5 | 3.7 | 2.7 | 1.7   |
| 8       | 3.6 | 4.3 | 10.2 | 15.1 | 33.6 | 27.3 | 3.3 | 2.3 | 0.3   |
| 9       | 3.3 | 3.6 | 9.5  | 14.1 | 31.5 | 31.5 | 4.3 | 2.0 | 0.3   |
| 10      | 3.0 | 3.0 | 8.9  | 12.2 | 32.9 | 32.6 | 5.3 | 2.0 | 0.3   |
| 11      | 1.7 | 3.0 | 9.2  | 10.2 | 34.0 | 34.7 | 4.9 | 2.3 | 0.0   |
| 12      | 2.0 | 2.3 | 7.6  | 10.6 | 35.3 | 33.0 | 6.9 | 2.3 | 0.0   |
| 13      | 2.3 | 2.3 | 6.9  | 10.9 | 37.6 | 31.7 | 6.3 | 2.0 | 0.0   |
| 14      | 2.0 | 2.0 | 7.5  | 10.5 | 39.0 | 30.5 | 5.9 | 2.3 | 0.3   |
| 15      | 2.3 | 2.3 | 6.9  | 11.2 | 40.9 | 29.7 | 4.0 | 2.3 | 0.3   |
| 16      | 2.3 | 3.0 | 5.9  | 11.9 | 42.5 | 28.6 | 3.6 | 2.0 | 0.3   |
| 17      | 2.3 | 2.0 | 6.9  | 13.5 | 44.8 | 24.7 | 3.6 | 2.0 | 0.3   |
| 18      | 3.0 | 2.3 | 8.2  | 15.5 | 43.8 | 22.1 | 3.3 | 1.6 | 0.3   |
| 19      | 3.3 | 2.3 | 7.3  | 16.2 | 43.6 | 20.1 | 3.0 | 3.0 | 1.3   |
| 20      | 3.3 | 2.3 | 7.6  | 17.4 | 42.5 | 19.4 | 3.6 | 3.0 | 1.0   |
| 21      | 2.3 | 3.6 | 8.9  | 18.1 | 41.8 | 18.8 | 3.6 | 2.0 | 1.0   |
| 22      | 3.0 | 3.0 | 8.2  | 19.4 | 41.5 | 18.8 | 2.3 | 2.3 | 1.6   |
| 23      | 2.3 | 3.0 | 8.6  | 19.8 | 39.2 | 21.1 | 3.6 | 1.6 | 1.0   |
| 24      | 2.3 | 3.0 | 8.6  | 20.7 | 38.2 | 20.1 | 3.0 | 2.3 | 2.0   |
| Mean .. | 2.4 | 2.8 | 8.0  | 16.1 | 37.3 | 25.7 | 4.0 | 2.2 | 1.5   |

TABLE XXI.  
PERCENTAGE FREQUENCY OF WIND DIRECTION: JUNE.  
(1901-1920.)

| Hour.   | N.  | NE. | E.   | SE.  | S.   | SW.  | W.  | NW. | Calm. |
|---------|-----|-----|------|------|------|------|-----|-----|-------|
| 1       | 1.7 | 2.3 | 7.3  | 21.7 | 36.5 | 19.4 | 5.0 | 1.7 | 4.3   |
| 2       | 1.7 | 2.3 | 7.7  | 20.3 | 34.9 | 21.3 | 5.6 | 2.0 | 4.3   |
| 3       | 1.7 | 2.3 | 8.3  | 19.7 | 33.7 | 21.0 | 5.6 | 2.7 | 5.0   |
| 4       | 1.7 | 2.3 | 8.4  | 19.8 | 32.2 | 22.1 | 5.7 | 2.7 | 5.0   |
| 5       | 2.0 | 2.3 | 8.4  | 19.5 | 31.2 | 23.2 | 5.4 | 3.0 | 5.0   |
| 6       | 1.3 | 2.3 | 8.9  | 20.5 | 31.4 | 21.4 | 6.9 | 2.3 | 5.0   |
| 7       | 1.3 | 3.3 | 10.0 | 21.6 | 31.3 | 21.0 | 6.3 | 2.0 | 3.0   |
| 8       | 2.3 | 3.0 | 11.3 | 22.2 | 29.5 | 22.9 | 6.3 | 1.7 | 1.0   |
| 9       | 2.3 | 3.0 | 12.3 | 20.9 | 27.2 | 25.5 | 6.3 | 1.7 | 1.0   |
| 10      | 1.7 | 3.0 | 13.1 | 19.2 | 24.6 | 30.0 | 5.7 | 2.4 | 0.3   |
| 11      | 2.3 | 3.7 | 12.4 | 18.5 | 23.5 | 28.5 | 7.4 | 3.0 | 0.7   |
| 12      | 2.7 | 3.7 | 13.1 | 14.4 | 27.1 | 27.1 | 9.0 | 2.7 | 0.3   |
| 13      | 2.3 | 4.0 | 13.6 | 16.6 | 26.9 | 24.9 | 9.0 | 2.7 | 0.0   |
| 14      | 2.3 | 3.0 | 12.7 | 17.1 | 27.4 | 26.4 | 7.7 | 3.0 | 0.3   |
| 15      | 2.7 | 4.0 | 11.6 | 16.2 | 32.5 | 22.9 | 6.3 | 3.7 | 0.3   |
| 16      | 3.0 | 3.0 | 11.0 | 17.0 | 35.7 | 20.7 | 6.0 | 3.3 | 0.3   |
| 17      | 2.3 | 2.3 | 11.0 | 20.3 | 35.7 | 20.0 | 5.7 | 2.3 | 0.3   |
| 18      | 2.4 | 2.4 | 9.1  | 20.6 | 36.0 | 20.6 | 5.1 | 2.4 | 1.7   |
| 19      | 2.3 | 2.0 | 7.7  | 21.7 | 35.8 | 20.4 | 4.7 | 2.3 | 3.0   |
| 20      | 2.7 | 2.0 | 8.0  | 21.3 | 36.9 | 19.6 | 4.3 | 2.7 | 2.7   |
| 21      | 1.7 | 2.3 | 7.0  | 22.9 | 35.8 | 20.9 | 5.0 | 2.3 | 2.3   |
| 22      | 1.7 | 2.0 | 7.0  | 23.1 | 37.1 | 20.1 | 5.0 | 2.3 | 1.7   |
| 23      | 2.3 | 2.3 | 7.7  | 22.5 | 36.3 | 19.1 | 5.4 | 2.0 | 2.3   |
| 24      | 2.0 | 2.3 | 8.7  | 22.3 | 35.6 | 18.3 | 6.0 | 2.7 | 2.3   |
| Mean .. | 2.1 | 2.7 | 9.8  | 20.0 | 32.3 | 22.4 | 6.1 | 2.5 | 2.2   |

TABLE XXII.

PERCENTAGE FREQUENCY OF WIND DIRECTION: JULY.  
(1901-1920.)

| Hour.   | N.  | NE. | E.   | SE.  | S.   | SW.  | W.   | NW. | Calm. |
|---------|-----|-----|------|------|------|------|------|-----|-------|
| 1       | 1.9 | 1.0 | 6.8  | 19.4 | 25.9 | 29.1 | 7.8  | 2.6 | 5.5   |
| 2       | 1.9 | 1.3 | 7.1  | 19.4 | 24.9 | 29.1 | 7.1  | 2.9 | 6.2   |
| 3       | 1.3 | 1.6 | 8.1  | 19.4 | 23.9 | 29.7 | 7.7  | 2.3 | 6.1   |
| 4       | 1.9 | 1.3 | 8.1  | 19.4 | 22.6 | 30.7 | 9.0  | 2.6 | 4.5   |
| 5       | 1.6 | 1.6 | 8.4  | 20.1 | 21.0 | 29.8 | 9.1  | 2.3 | 6.2   |
| 6       | 1.3 | 1.6 | 9.4  | 19.4 | 21.0 | 30.1 | 9.7  | 1.9 | 5.5   |
| 7       | 1.6 | 2.3 | 10.7 | 19.0 | 21.0 | 31.0 | 8.7  | 2.3 | 3.6   |
| 8       | 1.6 | 2.9 | 13.3 | 16.8 | 19.7 | 31.4 | 10.7 | 1.9 | 1.6   |
| 9       | 1.9 | 1.9 | 14.5 | 16.7 | 18.0 | 31.8 | 11.9 | 2.2 | 1.0   |
| 10      | 1.6 | 1.9 | 15.1 | 16.4 | 19.0 | 30.7 | 11.9 | 2.2 | 1.0   |
| 11      | 1.6 | 2.9 | 14.4 | 16.3 | 18.2 | 30.4 | 12.4 | 3.2 | 0.6   |
| 12      | 1.6 | 3.2 | 14.2 | 15.1 | 20.3 | 30.0 | 11.6 | 3.5 | 0.3   |
| 13      | 1.9 | 2.6 | 13.3 | 16.2 | 21.7 | 30.4 | 11.3 | 2.3 | 0.3   |
| 14      | 2.3 | 3.9 | 13.3 | 15.8 | 24.5 | 26.8 | 11.0 | 1.9 | 0.7   |
| 15      | 2.3 | 3.2 | 11.3 | 18.7 | 26.1 | 26.8 | 9.4  | 1.9 | 0.3   |
| 16      | 1.6 | 2.3 | 11.3 | 17.8 | 29.5 | 26.9 | 8.4  | 1.6 | 0.7   |
| 17      | 1.3 | 1.9 | 9.7  | 18.4 | 30.7 | 26.9 | 7.8  | 2.3 | 1.0   |
| 18      | 1.6 | 1.0 | 8.1  | 19.8 | 33.1 | 25.0 | 7.8  | 2.6 | 1.0   |
| 19      | 1.6 | 1.6 | 7.4  | 18.4 | 31.7 | 26.8 | 7.8  | 2.3 | 2.3   |
| 20      | 1.6 | 1.3 | 6.8  | 19.7 | 30.7 | 26.8 | 7.4  | 2.9 | 2.9   |
| 21      | 1.0 | 1.0 | 6.8  | 19.3 | 31.9 | 25.5 | 7.4  | 3.2 | 3.9   |
| 22      | 1.3 | 1.3 | 7.1  | 19.8 | 30.7 | 25.9 | 7.4  | 3.2 | 3.2   |
| 23      | 1.0 | 1.6 | 7.4  | 20.3 | 29.3 | 26.8 | 6.8  | 2.9 | 3.9   |
| 24      | 1.6 | 1.0 | 7.4  | 20.7 | 26.8 | 28.5 | 6.8  | 2.3 | 4.8   |
| Mean .. | 1.6 | 1.9 | 10.0 | 18.4 | 25.1 | 28.6 | 9.0  | 2.5 | 2.8   |

TABLE XXIII.

PERCENTAGE FREQUENCY OF WIND DIRECTION : AUGUST.  
(1901-1920.)

| Hour.   | N.  | NE. | E.   | SE.  | S.   | SW.  | W.   | NW. | Calm. |
|---------|-----|-----|------|------|------|------|------|-----|-------|
| 1       | 1.6 | 1.3 | 7.7  | 19.9 | 28.0 | 23.8 | 7.7  | 2.6 | 7.4   |
| 2       | 1.6 | 1.6 | 7.1  | 18.7 | 25.8 | 25.5 | 7.7  | 2.3 | 9.7   |
| 3       | 1.9 | 1.9 | 7.1  | 18.7 | 23.9 | 24.5 | 8.0  | 2.3 | 11.6  |
| 4       | 2.3 | 1.6 | 8.7  | 19.9 | 23.2 | 25.4 | 8.4  | 2.3 | 8.4   |
| 5       | 2.3 | 2.3 | 8.7  | 19.3 | 22.5 | 25.1 | 8.0  | 2.3 | 9.6   |
| 6       | 2.3 | 2.3 | 10.3 | 18.0 | 20.6 | 24.4 | 8.7  | 2.3 | 11.3  |
| 7       | 1.9 | 2.3 | 11.3 | 19.8 | 21.1 | 24.3 | 8.4  | 3.3 | 8.8   |
| 8       | 2.3 | 2.9 | 14.5 | 20.7 | 20.0 | 23.9 | 9.7  | 3.2 | 2.9   |
| 9       | 1.9 | 3.2 | 15.9 | 21.7 | 17.5 | 25.9 | 9.1  | 3.6 | 1.3   |
| 10      | 2.3 | 3.8 | 16.1 | 20.3 | 16.7 | 27.3 | 10.3 | 2.9 | 0.3   |
| 11      | 1.9 | 2.9 | 16.8 | 19.7 | 17.1 | 27.1 | 10.0 | 4.2 | 0.3   |
| 12      | 2.3 | 2.9 | 18.1 | 16.8 | 18.4 | 28.1 | 9.0  | 4.2 | 0.3   |
| 13      | 2.3 | 3.2 | 15.2 | 17.5 | 20.4 | 28.1 | 8.7  | 4.2 | 0.3   |
| 14      | 2.6 | 2.3 | 14.8 | 19.3 | 20.9 | 26.1 | 9.7  | 3.9 | 0.7   |
| 15      | 2.3 | 2.6 | 13.9 | 20.7 | 24.3 | 23.6 | 7.8  | 4.2 | 0.6   |
| 16      | 2.9 | 2.3 | 11.3 | 22.0 | 27.5 | 23.6 | 7.4  | 2.6 | 0.3   |
| 17      | 3.5 | 2.2 | 9.9  | 21.5 | 30.1 | 22.1 | 6.7  | 2.2 | 1.6   |
| 18      | 2.9 | 1.9 | 8.7  | 20.9 | 31.2 | 23.2 | 6.1  | 2.3 | 2.9   |
| 19      | 2.9 | 1.9 | 6.8  | 20.3 | 30.0 | 23.9 | 6.8  | 1.9 | 5.5   |
| 20      | 2.6 | 1.0 | 6.1  | 21.3 | 29.7 | 23.5 | 7.4  | 1.9 | 6.5   |
| 21      | 2.3 | 1.0 | 6.5  | 21.0 | 29.5 | 23.6 | 7.8  | 1.9 | 6.5   |
| 22      | 1.6 | 1.0 | 6.8  | 20.8 | 30.2 | 23.1 | 7.5  | 1.9 | 7.1   |
| 23      | 1.9 | 1.3 | 6.8  | 20.1 | 29.1 | 22.0 | 7.4  | 2.6 | 8.7   |
| 24      | 2.3 | 1.3 | 6.4  | 19.6 | 28.6 | 22.5 | 7.7  | 2.3 | 9.3   |
| Mean .. | 2.2 | 2.1 | 10.6 | 19.9 | 24.4 | 24.6 | 8.2  | 2.8 | 5.1   |



TABLE XXIV.

PERCENTAGE FREQUENCY OF WIND DIRECTION: SEPTEMBER.  
(1901-1920.)

| Hour.   | N.  | NE. | E.   | SE.  | S.   | SW.  | W.   | NW. | Calm. |
|---------|-----|-----|------|------|------|------|------|-----|-------|
| 1       | 3.7 | 3.0 | 8.3  | 17.3 | 22.0 | 19.0 | 7.7  | 3.3 | 15.7  |
| 2       | 3.3 | 3.3 | 8.7  | 17.7 | 22.4 | 19.7 | 7.0  | 3.3 | 14.4  |
| 3       | 3.7 | 3.3 | 8.3  | 17.0 | 21.3 | 20.0 | 7.3  | 3.3 | 15.7  |
| 4       | 5.0 | 3.0 | 9.4  | 16.4 | 20.1 | 20.9 | 7.4  | 3.3 | 14.4  |
| 5       | 5.0 | 3.7 | 10.3 | 15.9 | 18.9 | 20.6 | 6.3  | 3.0 | 16.3  |
| 6       | 5.3 | 3.7 | 11.0 | 16.3 | 17.7 | 19.0 | 7.0  | 3.0 | 17.0  |
| 7       | 5.3 | 3.7 | 12.0 | 16.6 | 18.9 | 19.6 | 8.0  | 3.7 | 12.3  |
| 8       | 5.7 | 3.7 | 13.0 | 18.3 | 18.3 | 23.0 | 9.7  | 5.0 | 3.3   |
| 9       | 5.3 | 3.7 | 14.3 | 19.7 | 15.7 | 24.7 | 11.3 | 5.0 | 0.3   |
| 10      | 5.7 | 4.7 | 15.9 | 17.3 | 15.3 | 23.6 | 12.3 | 5.0 | 0.3   |
| 11      | 4.7 | 4.0 | 18.3 | 16.7 | 15.0 | 23.3 | 11.7 | 6.3 | 0.0   |
| 12      | 5.0 | 4.3 | 17.3 | 17.9 | 14.3 | 22.9 | 11.0 | 7.0 | 0.3   |
| 13      | 4.4 | 3.7 | 16.8 | 18.5 | 17.5 | 22.2 | 10.4 | 6.4 | 0.4   |
| 14      | 5.3 | 4.3 | 15.6 | 18.3 | 17.9 | 21.6 | 10.6 | 6.0 | 0.3   |
| 15      | 6.0 | 5.0 | 14.3 | 18.9 | 19.6 | 19.6 | 10.0 | 6.0 | 0.7   |
| 16      | 5.3 | 4.3 | 11.7 | 19.0 | 22.7 | 20.3 | 9.7  | 5.3 | 1.7   |
| 17      | 5.3 | 4.0 | 10.3 | 20.9 | 21.3 | 20.9 | 8.6  | 6.0 | 2.7   |
| 18      | 5.4 | 3.7 | 9.1  | 18.8 | 23.2 | 20.5 | 8.4  | 6.1 | 5.2   |
| 19      | 4.4 | 3.0 | 7.7  | 17.1 | 21.2 | 21.5 | 7.7  | 5.4 | 12.1  |
| 20      | 4.3 | 2.6 | 7.7  | 18.3 | 21.3 | 20.9 | 8.3  | 5.0 | 11.6  |
| 21      | 3.7 | 3.0 | 7.7  | 19.3 | 22.0 | 19.7 | 7.7  | 5.3 | 11.7  |
| 22      | 4.3 | 2.7 | 7.9  | 19.9 | 23.2 | 19.6 | 8.3  | 4.7 | 9.6   |
| 23      | 3.7 | 3.0 | 8.0  | 19.0 | 22.0 | 19.3 | 8.0  | 4.0 | 13.0  |
| 24      | 4.3 | 3.0 | 7.3  | 17.3 | 22.3 | 19.6 | 8.0  | 4.0 | 14.3  |
| Mean .. | 4.8 | 3.6 | 11.3 | 18.0 | 19.8 | 20.9 | 8.9  | 4.8 | 8.1   |

TABLE XXV.

PERCENTAGE FREQUENCY OF WIND DIRECTION: OCTOBER.  
(1901-1920.)

| Hour.   | N.   | NE. | E.   | SE.  | S.  | SW.  | W.   | NW.  | Calm. |
|---------|------|-----|------|------|-----|------|------|------|-------|
| 1       | 14.5 | 4.5 | 7.4  | 9.4  | 7.1 | 11.3 | 8.7  | 10.0 | 27.1  |
| 2       | 14.6 | 4.9 | 8.1  | 8.8  | 6.2 | 10.4 | 9.1  | 11.1 | 26.9  |
| 3       | 14.4 | 4.2 | 7.4  | 9.6  | 7.1 | 10.9 | 9.3  | 10.0 | 27.2  |
| 4       | 15.9 | 3.6 | 8.1  | 9.4  | 6.5 | 10.7 | 9.1  | 11.3 | 25.6  |
| 5       | 15.8 | 3.9 | 8.7  | 9.7  | 6.8 | 10.0 | 8.7  | 11.6 | 24.8  |
| 6       | 17.3 | 4.2 | 9.3  | 9.0  | 6.7 | 10.6 | 7.4  | 9.9  | 25.6  |
| 7       | 16.5 | 5.2 | 9.4  | 10.0 | 6.8 | 11.0 | 8.7  | 10.0 | 22.6  |
| 8       | 19.0 | 5.5 | 11.3 | 12.6 | 6.4 | 12.3 | 10.7 | 12.6 | 9.7   |
| 9       | 19.1 | 6.8 | 13.6 | 11.3 | 6.5 | 12.6 | 13.6 | 13.6 | 2.9   |
| 10      | 19.3 | 8.0 | 13.5 | 11.3 | 6.4 | 13.8 | 13.2 | 13.5 | 1.0   |
| 11      | 18.3 | 7.4 | 15.8 | 10.3 | 4.8 | 15.1 | 13.2 | 13.5 | 1.6   |
| 12      | 17.0 | 9.0 | 16.4 | 8.4  | 5.5 | 16.4 | 12.6 | 13.2 | 1.6   |
| 13      | 18.3 | 8.0 | 14.8 | 9.0  | 5.8 | 15.5 | 11.9 | 15.8 | 1.0   |
| 14      | 18.4 | 7.1 | 13.2 | 10.7 | 7.4 | 14.2 | 11.0 | 17.4 | 0.6   |
| 15      | 20.0 | 6.1 | 11.9 | 11.0 | 7.4 | 14.5 | 12.3 | 15.8 | 1.0   |
| 16      | 21.9 | 5.8 | 11.9 | 11.3 | 7.4 | 13.2 | 11.3 | 15.5 | 1.6   |
| 17      | 23.1 | 4.9 | 10.4 | 11.1 | 7.8 | 13.7 | 10.7 | 14.3 | 4.2   |
| 18      | 19.7 | 4.8 | 10.0 | 10.7 | 7.7 | 12.6 | 9.4  | 11.3 | 13.9  |
| 19      | 16.8 | 3.6 | 8.7  | 10.0 | 7.8 | 11.3 | 8.1  | 9.1  | 24.6  |
| 20      | 15.2 | 3.6 | 10.4 | 11.3 | 7.5 | 11.3 | 7.5  | 9.4  | 23.9  |
| 21      | 14.6 | 3.6 | 9.1  | 11.4 | 7.5 | 11.4 | 8.1  | 10.1 | 24.4  |
| 22      | 14.9 | 3.9 | 9.4  | 11.0 | 7.8 | 10.7 | 9.1  | 9.4  | 23.9  |
| 23      | 14.6 | 4.2 | 8.7  | 10.4 | 7.1 | 10.7 | 9.1  | 9.7  | 25.6  |
| 24      | 14.2 | 3.5 | 7.4  | 10.0 | 7.1 | 10.7 | 8.7  | 10.3 | 28.1  |
| Mean .. | 17.2 | 5.3 | 10.6 | 10.3 | 6.9 | 12.3 | 10.1 | 12.0 | 15.4  |

TABLE XXVI.

PERCENTAGE FREQUENCY OF WIND DIRECTION: NOVEMBER.  
(1901-1920.)

| HOUR.   | N.   | NE.  | E.   | SE. | S.  | SW. | W.  | NW.  | Calm. |
|---------|------|------|------|-----|-----|-----|-----|------|-------|
| 1       | 38.7 | 7.7  | 5.3  | 2.3 | 1.3 | 3.0 | 4.3 | 9.7  | 27.7  |
| 2       | 41.3 | 7.3  | 5.0  | 2.7 | 1.3 | 2.0 | 4.3 | 11.0 | 25.0  |
| 3       | 41.3 | 8.7  | 5.0  | 2.4 | 1.0 | 2.4 | 4.4 | 12.8 | 22.0  |
| 4       | 44.1 | 8.4  | 4.1  | 2.7 | 1.0 | 2.4 | 3.7 | 11.8 | 22.0  |
| 5       | 44.8 | 10.1 | 4.7  | 2.4 | 1.0 | 3.0 | 4.1 | 12.1 | 17.8  |
| 6       | 43.8 | 11.1 | 5.0  | 1.7 | 1.0 | 2.7 | 4.0 | 12.4 | 18.4  |
| 7       | 42.8 | 10.4 | 4.7  | 2.4 | 0.7 | 3.4 | 4.0 | 11.4 | 20.0  |
| 8       | 47.0 | 11.0 | 5.0  | 2.3 | 1.0 | 3.7 | 4.7 | 13.7 | 11.7  |
| 9       | 48.5 | 13.7 | 5.4  | 2.4 | 1.0 | 3.7 | 5.7 | 16.4 | 3.3   |
| 10      | 45.5 | 17.4 | 8.0  | 2.0 | 1.0 | 4.4 | 6.4 | 14.4 | 1.0   |
| 11      | 44.3 | 17.0 | 10.0 | 1.7 | 1.3 | 5.0 | 6.0 | 14.3 | 0.3   |
| 12      | 45.2 | 13.7 | 10.4 | 1.7 | 1.0 | 5.0 | 5.7 | 17.1 | 0.4   |
| 13      | 44.8 | 10.4 | 8.4  | 2.4 | 1.0 | 5.0 | 6.7 | 21.1 | 0.4   |
| 14      | 46.2 | 8.7  | 7.0  | 2.4 | 1.0 | 5.0 | 6.4 | 23.1 | 0.4   |
| 15      | 47.0 | 7.0  | 6.3  | 2.3 | 0.7 | 5.0 | 8.0 | 22.7 | 1.0   |
| 16      | 48.9 | 7.7  | 5.0  | 2.3 | 1.0 | 4.3 | 8.3 | 20.3 | 2.3   |
| 17      | 50.5 | 7.7  | 4.7  | 2.7 | 1.0 | 4.0 | 5.4 | 17.7 | 6.4   |
| 18      | 44.7 | 7.3  | 4.7  | 2.7 | 0.7 | 3.7 | 3.7 | 11.0 | 21.7  |
| 19      | 37.0 | 6.7  | 4.7  | 3.0 | 1.0 | 3.7 | 3.3 | 7.7  | 31.7  |
| 20      | 36.5 | 5.7  | 5.0  | 1.7 | 1.0 | 4.4 | 3.0 | 7.7  | 35.1  |
| 21      | 36.8 | 6.7  | 5.0  | 2.0 | 1.0 | 4.4 | 4.4 | 8.7  | 31.1  |
| 22      | 35.9 | 7.0  | 4.0  | 2.3 | 1.0 | 4.3 | 4.0 | 8.3  | 33.2  |
| 23      | 37.3 | 6.7  | 5.7  | 2.7 | 1.0 | 3.7 | 4.7 | 9.0  | 29.3  |
| 24      | 38.2 | 7.0  | 5.0  | 2.7 | 1.0 | 3.0 | 5.0 | 10.0 | 28.2  |
| Mean .. | 43.0 | 9.4  | 5.8  | 2.3 | 1.0 | 3.8 | 5.0 | 13.5 | 16.3  |

TABLE XXVII.

PERCENTAGE FREQUENCY OF WIND DIRECTION: DECEMBER.  
(1901-1920.)

| Hour.   | N.   | NE.  | E.  | SE. | S.  | SW. | W.  | NW.  | Calm. |
|---------|------|------|-----|-----|-----|-----|-----|------|-------|
| 1       | 43.3 | 5.3  | 1.0 | 0.3 | 0.7 | 2.3 | 2.9 | 16.7 | 27.5  |
| 2       | 47.5 | 4.9  | 1.0 | 0.3 | 0.3 | 2.0 | 3.6 | 19.4 | 21.0  |
| 3       | 49.9 | 5.6  | 1.0 | 0.3 | 0.3 | 1.6 | 3.6 | 18.0 | 19.7  |
| 4       | 49.5 | 6.6  | 1.3 | 0.3 | 0.7 | 1.6 | 2.9 | 20.7 | 16.3  |
| 5       | 52.6 | 5.2  | 1.0 | 0.3 | 0.3 | 2.3 | 2.9 | 18.0 | 17.4  |
| 6       | 51.8 | 6.9  | 1.3 | 0.3 | 0.3 | 1.3 | 2.3 | 18.7 | 17.0  |
| 7       | 52.0 | 6.2  | 1.6 | 0.3 | 0.3 | 1.6 | 2.9 | 17.0 | 18.0  |
| 8       | 53.0 | 7.5  | 1.6 | 0.3 | 0.0 | 1.6 | 2.9 | 18.0 | 15.1  |
| 9       | 58.2 | 8.9  | 1.6 | 0.3 | 0.3 | 2.0 | 3.0 | 20.1 | 5.6   |
| 10      | 58.2 | 11.5 | 2.6 | 0.3 | 0.3 | 2.3 | 3.6 | 19.4 | 1.6   |
| 11      | 55.8 | 12.8 | 4.3 | 0.3 | 0.7 | 2.6 | 3.3 | 18.7 | 1.6   |
| 12      | 54.0 | 10.9 | 3.6 | 0.7 | 1.0 | 3.0 | 4.3 | 22.7 | 0.0   |
| 13      | 53.8 | 7.5  | 2.3 | 0.7 | 0.7 | 2.9 | 6.8 | 25.1 | 0.4   |
| 14      | 51.3 | 5.5  | 2.3 | 0.7 | 1.0 | 2.9 | 7.2 | 29.1 | 0.0   |
| 15      | 51.5 | 5.6  | 2.0 | 0.3 | 0.7 | 2.3 | 7.5 | 29.9 | 0.3   |
| 16      | 54.3 | 4.6  | 1.7 | 0.3 | 0.7 | 2.0 | 6.6 | 29.3 | 0.7   |
| 17      | 58.6 | 4.6  | 1.3 | 0.3 | 0.3 | 1.7 | 5.3 | 24.4 | 3.6   |
| 18      | 49.4 | 4.3  | 1.0 | 0.3 | 0.3 | 1.6 | 3.6 | 17.7 | 21.9  |
| 19      | 38.5 | 3.6  | 1.0 | 0.3 | 0.3 | 1.7 | 3.0 | 13.8 | 37.8  |
| 20      | 36.2 | 4.3  | 0.7 | 0.3 | 0.3 | 1.7 | 3.6 | 13.2 | 39.8  |
| 21      | 36.3 | 3.9  | 1.0 | 0.3 | 0.3 | 1.6 | 2.9 | 12.8 | 40.8  |
| 22      | 36.9 | 3.9  | 1.0 | 0.3 | 0.7 | 1.6 | 3.6 | 13.7 | 38.2  |
| 23      | 39.6 | 4.3  | 1.3 | 0.3 | 0.7 | 1.3 | 2.9 | 14.1 | 35.6  |
| 24      | 42.8 | 4.3  | 1.3 | 0.3 | 0.7 | 2.0 | 2.9 | 16.0 | 29.7  |
| Mean .. | 49.0 | 6.2  | 1.6 | 0.3 | 0.5 | 2.0 | 3.9 | 19.4 | 17.1  |

TABLE XXVIII.  
NORMALS OF UPPER AIR WINDS.  
(Alipore and Diamond Harbour Combined.)  
Height above sea=0.01 Km.

| Height in Kms.<br>above sea. | JANUARY. |      |      |     |                  | FEBRUARY. |      |      |     |                  | MARCH. |      |      |     |                  |
|------------------------------|----------|------|------|-----|------------------|-----------|------|------|-----|------------------|--------|------|------|-----|------------------|
|                              | N.       | Vm.  | Vr.  | Dn. | No. of<br>years. | N.        | Vm.  | Vr.  | Dn. | No. of<br>years. | N.     | Vm.  | Vr.  | Dn. | No. of<br>years. |
| 0.2                          | 116      | 5.0  | 2.6  | 25  | 4                | 111       | 5.9  | 1.6  | 307 | 4                | 122    | 6.7  | 4.3  | 240 | 4                |
| 0.5                          | 142      | 5.1  | 3.6  | 354 | 5                | 125       | 5.9  | 2.7  | 308 | 5                | 140    | 6.5  | 3.7  | 255 | 5                |
| 1.0                          | 141      | 5.0  | 3.8  | 329 | 5                | 121       | 5.9  | 4.2  | 299 | 5                | 139    | 5.7  | 3.6  | 270 | 5                |
| 1.5                          | 135      | 6.6  | 5.5  | 309 | 5                | 118       | 7.5  | 6.5  | 297 | 5                | 135    | 5.9  | 4.4  | 286 | 5                |
| 2.0                          | 124      | 8.3  | 7.0  | 304 | 5                | 113       | 10.3 | 9.3  | 295 | 5                | 129    | 7.0  | 5.8  | 292 | 5                |
| 2.5                          | 116      | 10.2 | 8.8  | 296 | 5                | 96        | 12.5 | 11.4 | 295 | 5                | 119    | 8.4  | 7.4  | 295 | 5                |
| 3.0                          | 101      | 11.1 | 9.8  | 287 | 5                | 85        | 14.0 | 13.0 | 293 | 5                | 115    | 9.6  | 8.8  | 297 | 5                |
| 3.5                          | 84       | 12.2 | 11.2 | 282 | 5                | 73        | 14.5 | 13.5 | 291 | 4                | 101    | 10.4 | 9.6  | 297 | 5                |
| 4.0                          | 73       | 13.1 | 11.9 | 274 | 5                | 65        | 15.3 | 14.3 | 290 | 4                | 96     | 10.9 | 10.0 | 295 | 4                |
| 4.5                          | 58       | 14.0 | 13.1 | 271 | 5                | 55        | 17.3 | 16.5 | 286 | 4                | 87     | 11.6 | 10.5 | 290 | 4                |
| 5.0                          | 84       | 12.2 | 11.2 | 282 | 5                | 73        | 14.5 | 13.5 | 291 | 4                | 101    | 10.4 | 9.6  | 297 | 5                |
| 5.5                          | 53       | 15.6 | 14.5 | 271 | 5                | 43        | 18.6 | 17.5 | 280 | 4                | 81     | 12.1 | 11.0 | 290 | 4                |
| 6.0                          | 34       | 18.8 | 17.9 | 267 | 4                | 28        | 21.1 | 20.5 | 275 | 4                | 68     | 14.2 | 13.1 | 280 | 4                |
| 7.0                          | 12       | 21.5 | 20.0 | 262 | 4                | 11        | 24.3 | 23.0 | 267 | 2                | 42     | 15.7 | 14.4 | 277 | 4                |
| 8.0                          | 4        | 22.7 | 20.9 | 262 | 3                | 3         | 23.8 | 23.5 | 279 | 2                | 17     | 18.3 | 16.9 | 274 | 4                |
| 9.0                          | ..       | ..   | ..   | ..  | ..               | ..        | ..   | ..   | ..  | ..               | ..     | ..   | ..   | ..  | ..               |
| 10.0                         | ..       | ..   | ..   | ..  | ..               | ..        | ..   | ..   | ..  | ..               | ..     | ..   | ..   | ..  | ..               |
| 11.0                         | ..       | ..   | ..   | ..  | ..               | ..        | ..   | ..   | ..  | ..               | ..     | ..   | ..   | ..  | ..               |

N=Number of observations.

Vm=Mean velocity irrespective of direction  
(arithmetical mean).

Vr=Mean resultant velocity (geometrical mean).

Dn=Resultant direction.

Velocity in metres per second.

TABLE XXIX.  
 NORMALS OF UPPER AIR WINDS.  
 (Alipore and Diamond Harbour Combined.)  
 Height above sea = 0.01 Km.

| Height in Kms.<br>above sea. | APRIL. |      |      |     |                  |  | MAY. |      |      |     |                  |  | JUNE. |     |     |     |                  |  |
|------------------------------|--------|------|------|-----|------------------|--|------|------|------|-----|------------------|--|-------|-----|-----|-----|------------------|--|
|                              | N.     | Vm.  | V r. | Dn. | No. of<br>years. |  | N.   | Vm.  | Vr.  | Dn. | No. of<br>years. |  | N.    | Vm. | Vr. | Dn. | No. of<br>years. |  |
| 0.2                          | 118    | 8.3  | 7.2  | 206 | 4                |  | 121  | 7.7  | 6.8  | 205 | 4                |  | 124   | 8.3 | 6.6 | 194 | 4                |  |
| 0.5                          | 163    | 8.7  | 6.7  | 217 | 6                |  | 183  | 8.6  | 7.4  | 211 | 7                |  | 185   | 8.1 | 6.6 | 214 | 7                |  |
| 1.0                          | 149    | 7.8  | 5.2  | 242 | 6                |  | 168  | 7.2  | 5.6  | 228 | 7                |  | 158   | 7.5 | 5.2 | 231 | 7                |  |
| 1.5                          | 132    | 7.2  | 5.0  | 263 | 6                |  | 149  | 6.0  | 4.0  | 255 | 7                |  | 130   | 6.5 | 3.5 | 258 | 7                |  |
| 2.0                          | 112    | 6.9  | 5.4  | 276 | 6                |  | 134  | 5.7  | 3.6  | 281 | 7                |  | 102   | 6.4 | 3.1 | 279 | 7                |  |
| 2.5                          | 99     | 7.8  | 6.7  | 287 | 6                |  | 119  | 6.3  | 4.3  | 305 | 7                |  | 82    | 6.3 | 2.9 | 303 | 7                |  |
| 3.0                          | 88     | 9.1  | 8.1  | 290 | 6                |  | 109  | 7.6  | 5.7  | 313 | 7                |  | 73    | 6.8 | 4.0 | 319 | 7                |  |
| 3.5                          | 79     | 10.5 | 9.5  | 295 | 6                |  | 102  | 8.8  | 7.2  | 315 | 7                |  | 57    | 7.2 | 4.4 | 333 | 7                |  |
| 4.0                          | 69     | 12.0 | 11.1 | 298 | 6                |  | 90   | 10.0 | 8.4  | 313 | 7                |  | 43    | 6.9 | 3.7 | 340 | 6                |  |
| 4.5                          | 65     | 13.1 | 12.1 | 299 | 6                |  | 76   | 9.4  | 7.5  | 307 | 7                |  | 39    | 6.1 | 2.7 | 357 | 6                |  |
| 5.0                          | 55     | 12.7 | 11.7 | 296 | 5                |  | 71   | 8.9  | 6.6  | 295 | 6                |  | 35    | 5.8 | 1.7 | 11  | 6                |  |
| 6.0                          | 44     | 12.9 | 11.7 | 287 | 5                |  | 56   | 8.4  | 5.8  | 280 | 5                |  | 22    | 5.8 | 2.9 | 102 | 4                |  |
| 7.0                          | 22     | 14.2 | 13.3 | 284 | 5                |  | 41   | 9.0  | 6.0  | 288 | 5                |  | 15    | 5.7 | 2.8 | 125 | 4                |  |
| 8.0                          | 14     | 15.2 | 13.8 | 275 | 4                |  | 30   | 9.1  | 5.4  | 265 | 5                |  | 9     | 6.7 | 3.2 | 132 | 4                |  |
| 9.0                          | 8      | 14.9 | 13.9 | 278 | 3                |  | 23   | 10.3 | 6.5  | 261 | 4                |  | 7     | 7.2 | 5.1 | 98  | 4                |  |
| 10.0                         | 3      | 9.2  | 6.2  | 299 | 2                |  | 13   | 8.9  | 6.6  | 249 | 4                |  | 6     | 7.9 | 3.3 | 114 | 3                |  |
| 11.0                         | 2      | 12.5 | 8.3  | 270 | 2                |  | 10   | 9.7  | 6.2  | 254 | 4                |  | 4     | 9.4 | 6.9 | 172 | 3                |  |
| 12.0                         | 2      | 6.0  | 6.0  | 300 | 1                |  | 4    | 11.5 | 11.2 | 251 | 3                |  | 3     | 8.8 | 8.2 | 193 | 2                |  |
| 13.0                         | 1      | 7.0  | 7.0  | 320 | 1                |  | 4    | 11.7 | 11.5 | 242 | 3                |  | 1     | 4.0 | 4.0 | 195 | 1                |  |
| 14.0                         | ..     | ..   | ..   | ..  | ..               |  | 1    | 9.0  | 9.0  | 235 | 1                |  | ..    | ..  | ..  | ..  | ..               |  |

N = Number of observations

Vm = Mean velocity irrespective of direction  
 (arithmetical mean).

Vr = Resultant direction.

Vm = Mean resultant velocity (geometrical mean).

Velocity in metres per second.

**TABLE XXX.**  
**NORMALS OF UPPER AIR WINDS.**  
*(Alipore and Diamond Harbour Combined.)*  
 Height above sea = 0.01 Km.

| Height in Kms.<br>above sea. | JULY. |      |      |     |                  | AUGUST. |      |      |     |                  | SEPTEMBER. |      |      |     |                  |
|------------------------------|-------|------|------|-----|------------------|---------|------|------|-----|------------------|------------|------|------|-----|------------------|
|                              | N.    | Vm.  | Vr.  | Dn. | No. of<br>years. | N.      | Vm.  | Vr.  | Dn. | No. of<br>years. | N.         | Vm.  | Vr.  | Dn. | No. of<br>years. |
| 0.2                          | 107   | 7.5  | 4.5  | 199 | 4                | 84      | 5.9  | 2.8  | 178 | 3                | 87         | 5.7  | 3.5  | 189 | 3                |
| 0.5                          | 167   | 7.6  | 4.6  | 210 | 7                | 166     | 6.7  | 3.1  | 215 | 7                | 156        | 6.2  | 3.0  | 178 | 6                |
| 1.0                          | 140   | 7.5  | 4.5  | 221 | 7                | 141     | 6.1  | 2.4  | 215 | 7                | 147        | 6.0  | 2.5  | 173 | 6                |
| 1.5                          | 103   | 7.0  | 4.2  | 218 | 7                | 117     | 5.6  | 2.3  | 216 | 7                | 130        | 5.6  | 2.0  | 172 | 6                |
| 2.0                          | 78    | 6.6  | 3.8  | 223 | 7                | 85      | 5.5  | 2.3  | 210 | 7                | 114        | 5.3  | 1.7  | 159 | 6                |
| 2.5                          | 58    | 6.5  | 3.3  | 226 | 7                | 68      | 5.2  | 2.1  | 181 | 7                | 99         | 5.2  | 1.7  | 151 | 6                |
| 3.0                          | 46    | 5.5  | 1.8  | 197 | 6                | 60      | 4.9  | 2.0  | 160 | 7                | 89         | 5.2  | 1.7  | 159 | 6                |
| 3.5                          | 36    | 5.3  | 2.3  | 192 | 6                | 51      | 5.0  | 2.5  | 142 | 7                | 79         | 5.4  | 1.9  | 170 | 6                |
| 4.0                          | 32    | 5.2  | 2.1  | 193 | 5                | 42      | 4.9  | 2.4  | 146 | 6                | 73         | 5.6  | 2.1  | 179 | 6                |
| 4.5                          | 28    | 4.5  | 2.1  | 194 | 5                | 37      | 4.9  | 2.5  | 143 | 6                | 65         | 5.3  | 2.1  | 160 | 6                |
| 5.0                          | 25    | 4.1  | 2.0  | 170 | 5                | 33      | 5.3  | 3.3  | 141 | 6                | 62         | 5.3  | 2.2  | 156 | 6                |
| 6.0                          | 18    | 5.3  | 3.2  | 147 | 5                | 27      | 4.9  | 3.7  | 134 | 5                | 47         | 5.0  | 1.7  | 151 | 5                |
| 7.0                          | 9     | 5.2  | 4.5  | 119 | 4                | 17      | 6.0  | 5.1  | 116 | 5                | 37         | 5.2  | 2.3  | 129 | 5                |
| 8.0                          | 9     | 7.6  | 7.4  | 111 | 5                | 10      | 7.5  | 6.9  | 110 | 5                | 31         | 5.7  | 2.3  | 131 | 5                |
| 9.0                          | 7     | 10.8 | 10.6 | 100 | 4                | 9       | 9.7  | 9.1  | 102 | 4                | 17         | 5.0  | 1.5  | 120 | 5                |
| 10.0                         | 3     | 15.7 | 15.4 | 97  | 3                | 6       | 10.2 | 10.1 | 100 | 3                | 15         | 7.1  | 3.6  | 147 | 5                |
| 11.0                         | 1     | 16.0 | 16.0 | 90  | 1                | 2       | 13.5 | 13.1 | 93  | 2                | 10         | 6.1  | 1.9  | 139 | 4                |
| 12.0                         | 1     | 16.0 | 16.0 | 95  | 1                | 1       | 14.0 | 14.0 | 90  | 1                | 6          | 7.0  | 5.0  | 138 | 4                |
| 13.0                         | ..    | ..   | ..   | ..  | ..               | 1       | 18.0 | 18.0 | 70  | 1                | 6          | 7.3  | 5.4  | 124 | 4                |
| 14.0                         | ..    | ..   | ..   | ..  | ..               | ..      | ..   | ..   | ..  | ..               | 4          | 9.7  | 9.1  | 97  | 3                |
| 15.0                         | ..    | ..   | ..   | ..  | ..               | ..      | ..   | ..   | ..  | ..               | 2          | 16.3 | 15.9 | 104 | 1                |
| 16.0                         | ..    | ..   | ..   | ..  | ..               | ..      | ..   | ..   | ..  | ..               | 1          | 20.0 | 20.0 | 85  | 1                |

N=Number of observations.

Vm=Mean velocity irrespective of direction  
(arithmetical mean)

Vr=Mean resultant velocity (geometrical mean).

Dn=Resultant direction.

Velocity in metres per second.

TABLE XXXI.  
 NORMALS OF UPPER AIR WINDS.  
 (Alipore and Diamond Harbour Combined.)  
 Height above sea = 0.01 Km.

| Height in Kms.<br>above sea. | OCTOBER. |      |     |     |                  | NOVEMBER. |      |      |     |                  | DECEMBER. |      |      |     |                  |
|------------------------------|----------|------|-----|-----|------------------|-----------|------|------|-----|------------------|-----------|------|------|-----|------------------|
|                              | N.       | Vm.  | Vr. | Dn. | No. of<br>years. | N.        | Vm.  | Vr.  | Dn. | No. of<br>years. | N.        | Vm.  | Vr.  | Dn. | No. of<br>years. |
| 0.2                          | 87       | 4.6  | 1.2 | 22  | 3                | 85        | 6.3  | 5.3  | 18  | 3                | 90        | 6.5  | 5.9  | 18  | 3                |
| 0.5                          | 165      | 4.5  | 1.2 | 5   | 6                | 166       | 5.8  | 4.9  | 21  | 6                | 179       | 4.9  | 4.0  | 9   | 6                |
| 1.0                          | 163      | 4.5  | 1.8 | 1   | 6                | 167       | 5.2  | 4.1  | 6   | 6                | 180       | 5.1  | 4.1  | 346 | 6                |
| 1.5                          | 161      | 4.9  | 2.2 | 347 | 6                | 157       | 5.0  | 3.6  | 349 | 6                | 173       | 5.9  | 4.5  | 332 | 6                |
| 2.0                          | 153      | 5.2  | 1.8 | 318 | 6                | 146       | 5.3  | 3.0  | 311 | 6                | 163       | 6.6  | 5.1  | 319 | 6                |
| 2.5                          | 142      | 5.3  | 2.3 | 281 | 6                | 135       | 5.8  | 3.6  | 287 | 6                | 152       | 8.0  | 6.5  | 308 | 6                |
| 3.0                          | 134      | 5.9  | 3.5 | 264 | 6                | 129       | 6.7  | 4.9  | 281 | 6                | 142       | 8.9  | 7.5  | 297 | 6                |
| 3.5                          | 125      | 6.8  | 4.5 | 257 | 6                | 118       | 7.7  | 6.5  | 277 | 6                | 128       | 9.9  | 8.5  | 290 | 6                |
| 4.0                          | 116      | 7.5  | 5.1 | 256 | 6                | 110       | 8.8  | 7.7  | 277 | 6                | 122       | 11.1 | 9.9  | 285 | 6                |
| 4.5                          | 110      | 8.0  | 5.7 | 259 | 6                | 105       | 9.9  | 8.9  | 275 | 5                | 117       | 12.7 | 11.5 | 281 | 6                |
| 5.0                          | 100      | 8.3  | 6.3 | 262 | 6                | 101       | 11.3 | 10.2 | 274 | 5                | 111       | 14.3 | 13.0 | 280 | 6                |
| 6.0                          | 86       | 9.2  | 7.2 | 266 | 6                | 92        | 13.6 | 12.7 | 274 | 5                | 82        | 16.0 | 14.7 | 274 | 6                |
| 7.0                          | 61       | 10.0 | 8.1 | 265 | 6                | 67        | 16.1 | 15.0 | 273 | 5                | 44        | 17.8 | 16.3 | 272 | 5                |
| 8.0                          | 35       | 11.8 | 9.2 | 258 | 6                | 28        | 15.6 | 14.6 | 277 | 5                | 15        | 19.5 | 17.3 | 270 | 5                |
| 9.0                          | 23       | 11.5 | 7.9 | 252 | 5                | 12        | 15.2 | 14.7 | 273 | 5                | 4         | 15.0 | 11.5 | 301 | 4                |
| 10.0                         | 10       | 10.3 | 7.8 | 263 | 4                | 3         | 17.5 | 17.2 | 269 | 3                | 2         | 8.5  | 6.5  | 332 | 2                |
| 11.0                         | 5        | 10.3 | 7.6 | 234 | 4                | 1         | 18.0 | 18.0 | 250 | 1                | 2         | 10.3 | 6.3  | 303 | 2                |
| 12.0                         | 2        | 12.5 | 6.7 | 223 | 2                |           |      |      |     |                  |           |      |      |     |                  |

N=Number of observations.

Vm=Mean velocity irrespective of direction  
(arithmetical mean).

Vr=Mean resultant velocity (geometrical mean).

Dn=Resultant direction.

Velocity in metres per second.



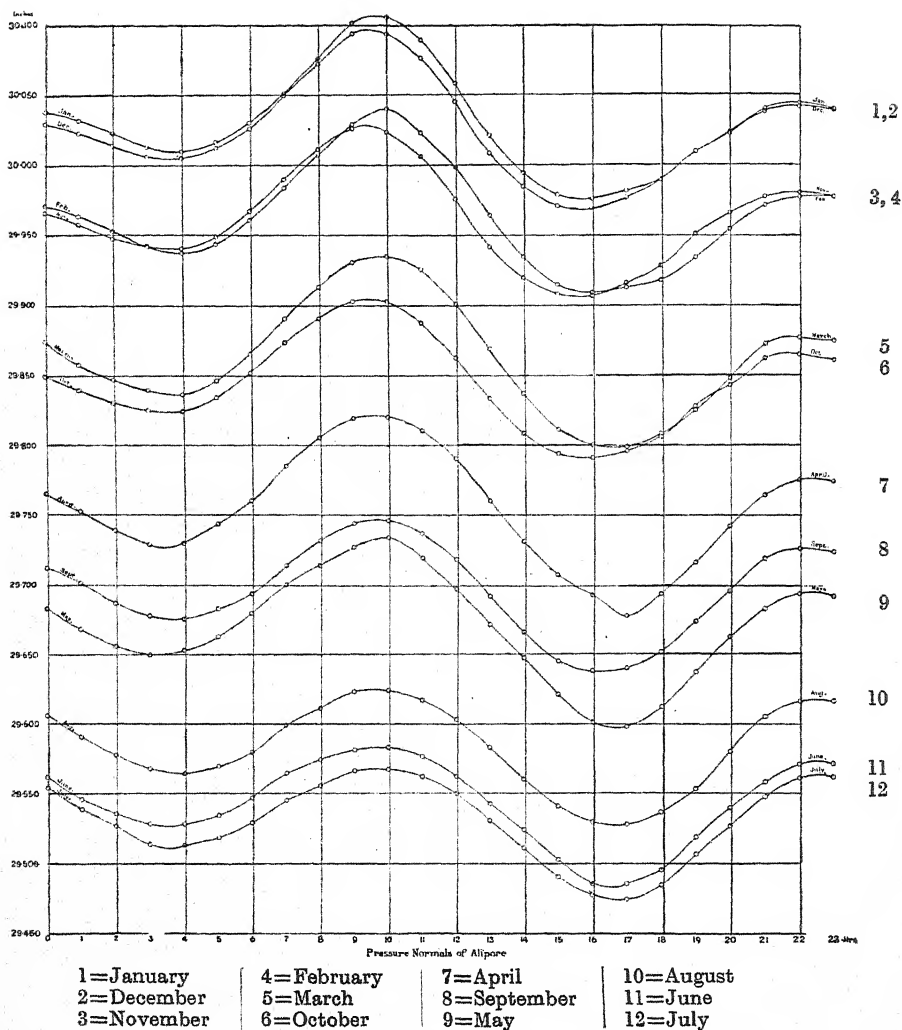


FIG. 2.—PRESSURE NORMALS OF ALIPORE.

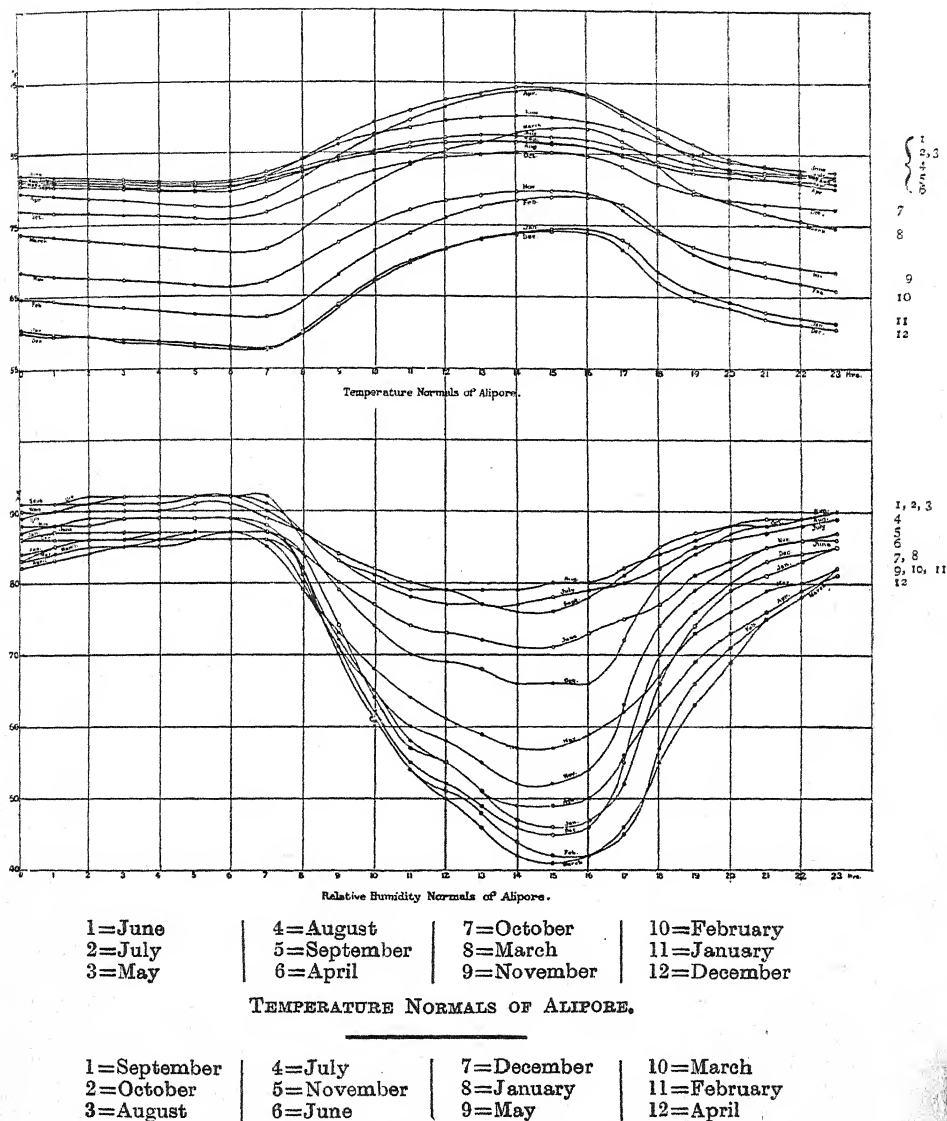


FIG. 3.—RELATIVE HUMIDITY NORMALS OF ALIPORE.

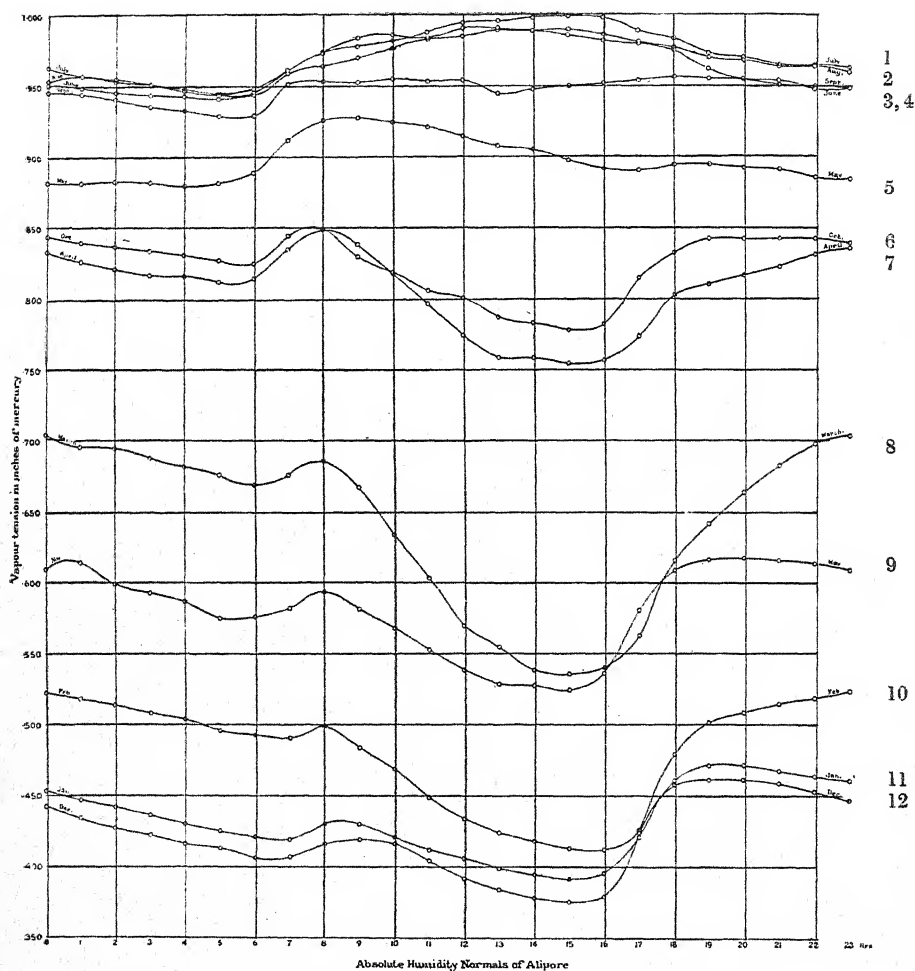
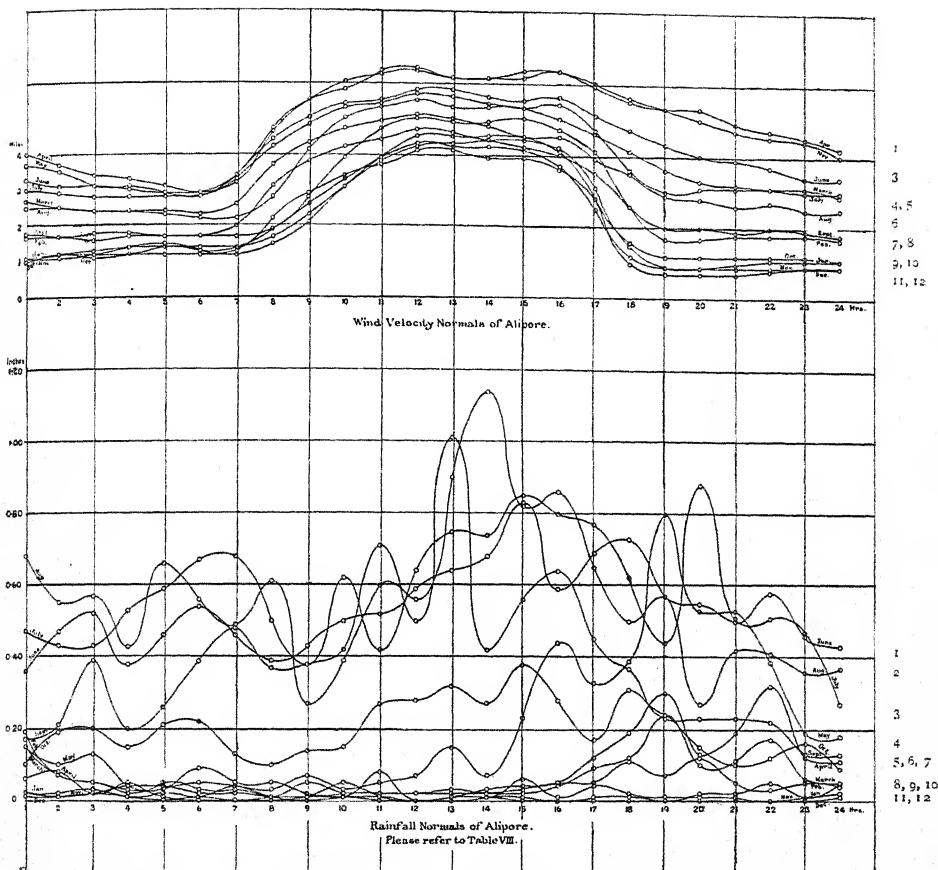


FIG. 4.—ABSOLUTE HUMIDITY. NORMALS OF ALIPORE.



1=April  
2=May  
3=June

4=July  
5=March  
6=August

7=September  
8=February  
9=October

10=January  
11=November  
12=December

#### WIND VELOCITY NORMALS OF ALIPORE.

1=June  
2=August  
3=July

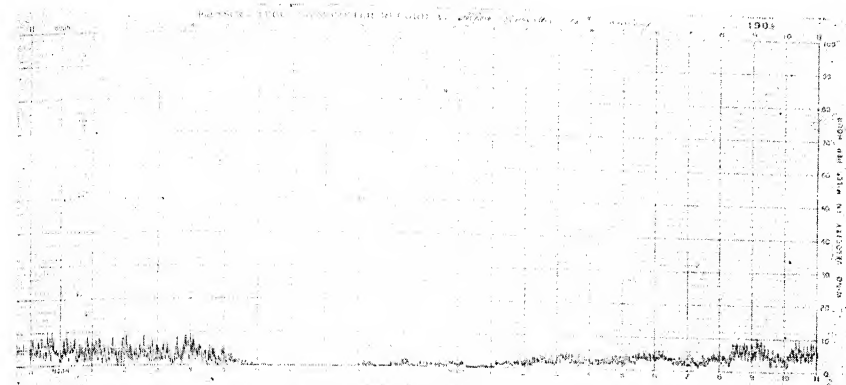
4=May  
5=September  
6=April

7=October  
8=March  
9=January

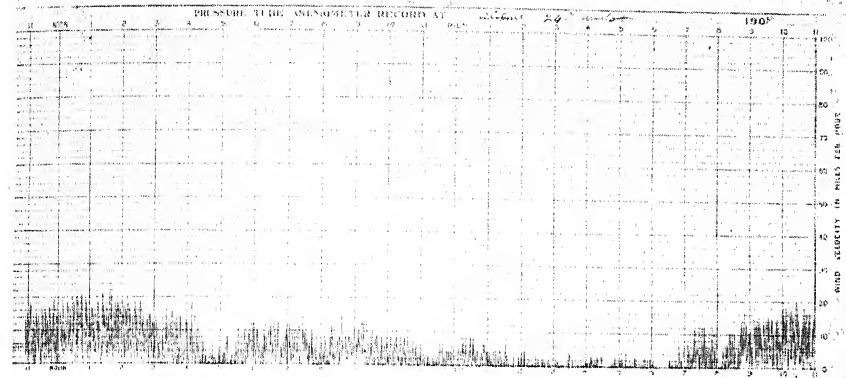
10=February  
11=November  
12=December

FIG. 5.—RAINFALL NORMALS OF ALIPORE.

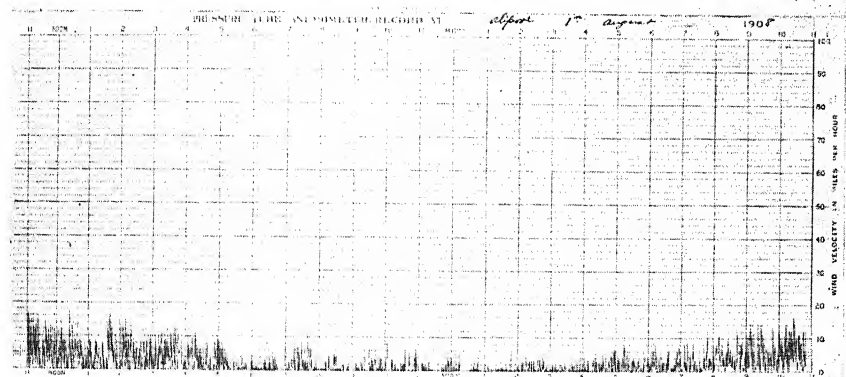




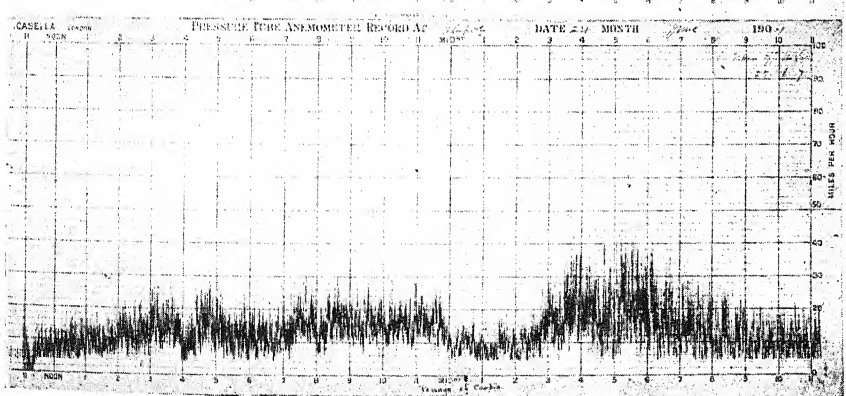
Winter



Hot weather

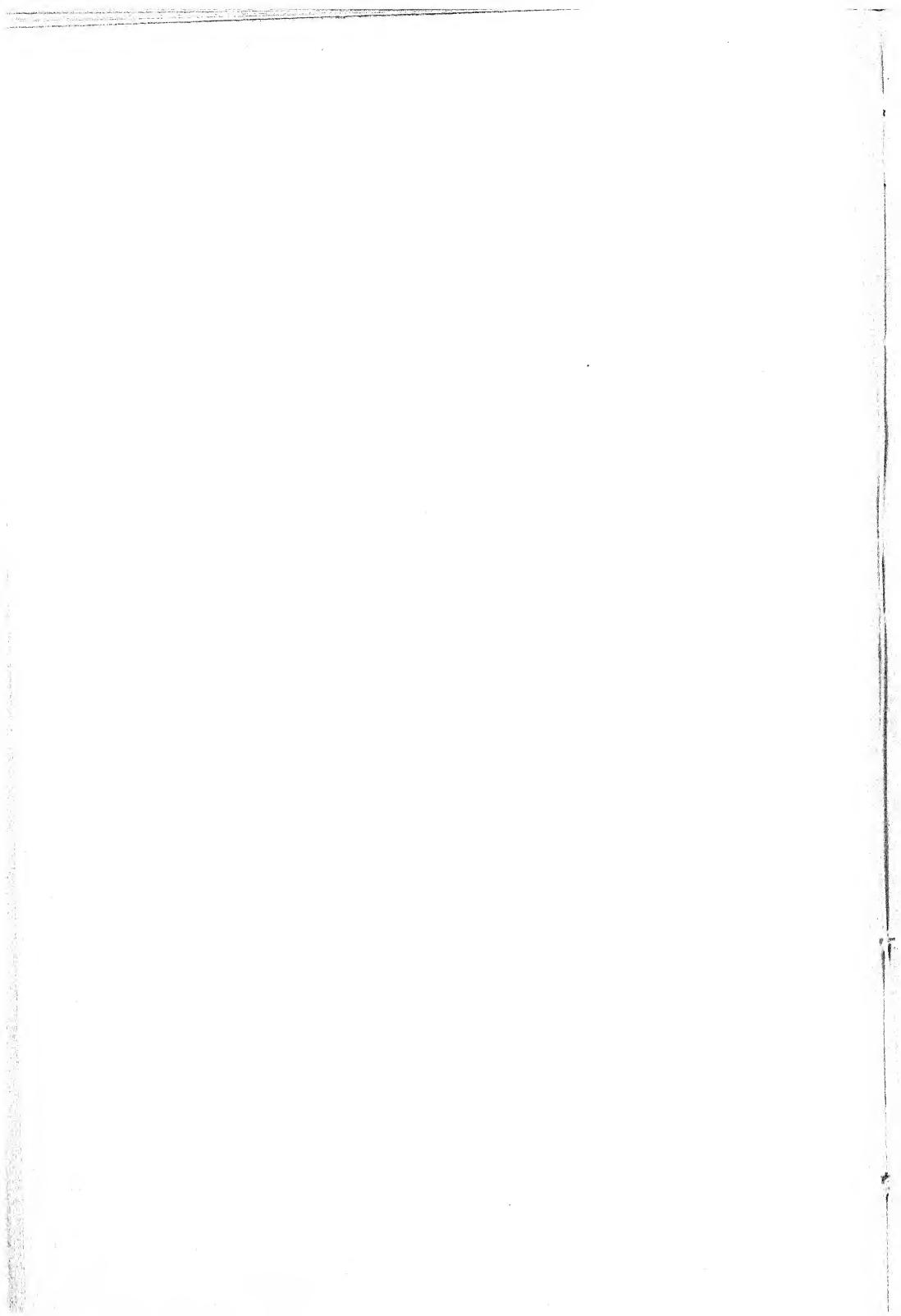


Monsoon



Storm

Typical Anemograms of Alipore.



## Ancient Monoliths of North Cachar.

By J. P. MILLS and J. H. HUTTON.

In January 1928 the first-named of the two writers of this article, when touring in the North Cachar Hills in Assam in pursuance of his official duties, happened to notice by the path near the village of Ndunglo and in the neighbourhood of a pair of linked tanks two unusual stones (Plate 17, Figs. 1 and 2.). These, on investigation, he found to be pear-shaped monoliths artificially dressed and each containing a cavity hollowed in the bulbous end. They were recumbent, but appeared at one time to have stood erect on their narrow ends. This discovery led him to enquiries and to a knowledge of the existence of a collection of similar stones at Bolasan, which he promptly visited and examined (Plates 20, Fig. 3; 22; and 23, Fig. 1.). With him at the time was Mr. W. H. Calvert, officer in charge of the Sub-division, who reported in April groups of more or less similar stones at Derebora, Kobak, and Kartong. These three groups, like the monoliths at Ndunglo and Bolasan are all on the west of the North Cachar Hills and near the boundary of the Jaintia Hills, and after having been visited by the first of us were visited and very carefully examined by both of us together in October 1928. No previous record of the discovery of these stones appears to exist at all. The second of us remembers to have heard a former Subdivisional Officer of the North Cachar Hills state that there were some queer monoliths near Derebora, and as the bridle path runs through this group, some stones of which have been actually cut down, *horrescimus referentes*, so that the path passes over their visible tops, its existence must have been known to a number of successive officers. It seems clear, however, that none of these groups had ever been reported in print. Since our visit the four most important groups have been gazetted as ancient monuments, and it is hoped that they may now succeed in surviving. The purpose of this article is to give a brief description of the five main groups and of some attendant features with some considerations as to their origin. How many more such relics still lie buried, in the jungle in these remote hills we cannot guess.

The monoliths dealt with fall into two distinct types, which may perhaps be divided into female and male. The former constitute the whole of the large group at Kartong, and a smaller group between Kartong and Kobak. Both these groups are extremely damaged. At Kartong, a Nepali grazier has been allowed to build his buffalo byres in the middle of the monoliths



most of which are damaged, while earlier vandals had previously split some of them into fragments suitable for erection as a row of small rough stone menhirs (Plate 20, Fig. 1.). The Kartong monoliths occupy two knolls, but nearly every stone visible is damaged. Mr. Calvert estimated the number of monoliths there as about 50. They are the shape of a truncated cone,

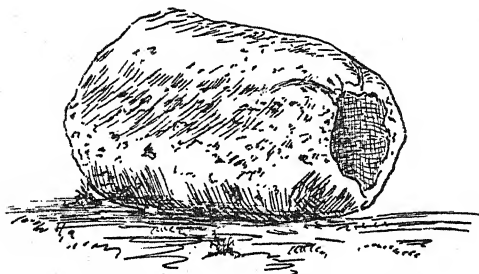


Fig. 1. Monolith at Kartong.

the flat base of which is less circular than elliptical, and they are hollow inside, the opening being at the small end and having a few suggestive lines cut towards the top. A smallish complete stone measured 3 ft. in

height and had a circumference at the base of 7 ft., the longer diameter being 2 ft. 7 inches and the shorter 1 ft. 7 inches. The circumference at the top was 3 ft. (Plates 18 and 19.). A larger specimen, much broken, had an approximate height of 4 ft. 8 inches and the base diameters were 3 ft. and 2 ft. 2 inches respectively. The second group of these stones is on a knoll between Kartong and Kobak, some five miles from the Kartong group. Only a few stones are to be found and all much damaged. They are in proximity to a pair of cairns but otherwise resemble precisely the monoliths at Kartong.

As in the case of two groups already referred to that at Kobak is on a hill top. The stones on this site belong to the male type but are not really pear-shaped, the top of the stone being conical rather than bulbous. The site seems to be of great age, since the stones are buried in the ground up to their greatest circumference, which is probably a good deal deeper than when they were set up. One stone, lying on the surface, was

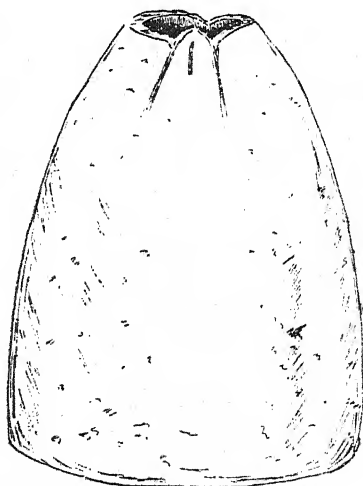


Fig. 2. Monolith at Kartong.

about 7 ft. long and approached the cylindrical much more nearly than the pear-shaped stones of Bolasan (Plate 21.). Most of these Kobak stones were incised with two bands round the top crossed by oblique lines chevron-wise and in between these bands were rough carvings; one had a pair of pigs and another a row of human heads resembling those depicted by Nagas for the heads of foes decapitated. All, however, were very much worn and there are probably a number of these monoliths entirely buried out of site. One monolith at least of this group had been broken up to make grave stones for the Christian village of Kobak.

These Kobak stones are, except for the carving, which is absent at Bolasan, identical in type with a small group at Bolasan separated from the others and apparently older than the main group (Plate 22, Fig. 1.). One of these lying exposed measured 5 ft. 8 inches in length and another standing vertically, but with half the top split away, measured 3 ft. 8 inches across the section at the bottom of the hollowed portion. The rest of the Bolasan stones are of the typical "pear" shape—bulbous, not quite flat

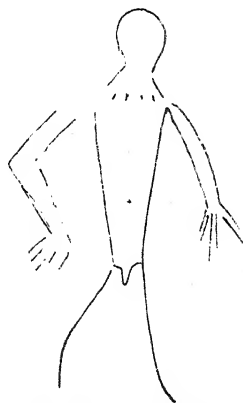


Fig. 3. Human figure on one of the small Kartong monoliths made from a hollow monolith split up.



Fig. 4. Monolith at Kobak.

across the top, but convex from the greatest circumference to the apex where the hole is. They are arranged in long lines, the big stones of the alignment often apparently having clusters

of smaller ones about them, rather as if the stones had stood, each group in front of a house, down long village streets just as in Ao villages, somewhat similar wooden posts are to be seen in front of houses on the street. Only in the latter case it is not

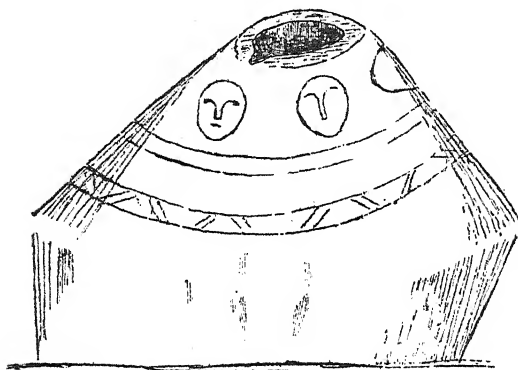


Fig. 5. Monolith at Kobak.

each house but occasional houses that have them and the stones at Bolasan are probably too close and too numerous to have stood in front of houses in this way (see Pls. 20, Fig. 3; and 23, Fig. 1.). We counted 400 in the group and some of the smaller

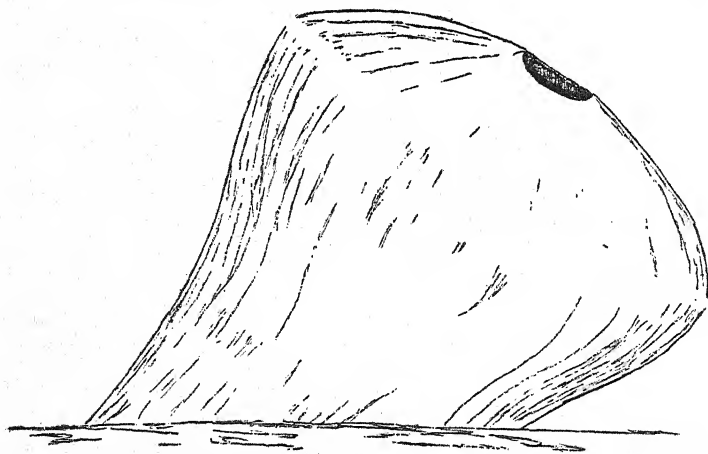


Fig. 6. Monolith at Bolasan.

of these were lying almost embedded in the ground, but generally speaking there has been little or no accretion of soil here and the monoliths have probably suffered much from annual burnings of the coarse grass which surrounds them

(Plate 22). One of the largest stones, with an almost flat top, measured 6 ft. 2 inches across the diameter of the top and another, less flat perhaps, two inches more. One of the big ones which was lying out of the ground on its side measured 6 ft. in

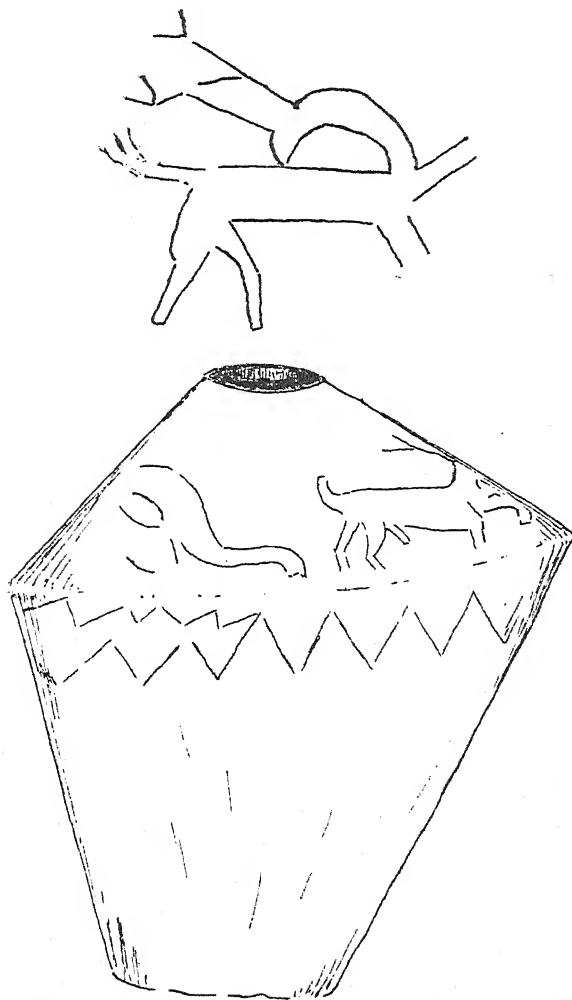


Fig. 7. Monolith at Bolasan.

height and had a hole 10 inches in diameter and two feet deep. A small one measured 2 ft. 3 inches in height with a greatest circumference of 4 ft. 6 inches and a hole 5 inches deep. The smallest we could find measured 1 ft. 4 inches high, 1 ft. 2 inches

in greatest diameter, and 3 ft. 10 $\frac{1}{2}$  inches in its greatest circumference, and had a hole 3 inches across and 8 inches deep (Plate 24, Fig. 1.). It was covered with rough carvings at the top consisting of a line or two of dog-tooth indentation pattern and deer and what was perhaps an elephant, while the other small stone referred to had representation of orbs, no doubt those of heaven, of a sort of covered vessel, of a long two-handed sword, and of what was perhaps a rainbow, a pattern which also appeared to be incised on one of the largest stone measuring 76 inches across the face and standing 4 feet above the surface of the ground. Another large but damaged stone must have stood 5 ft. above ground when complete, and a solitary stone standing by itself to het

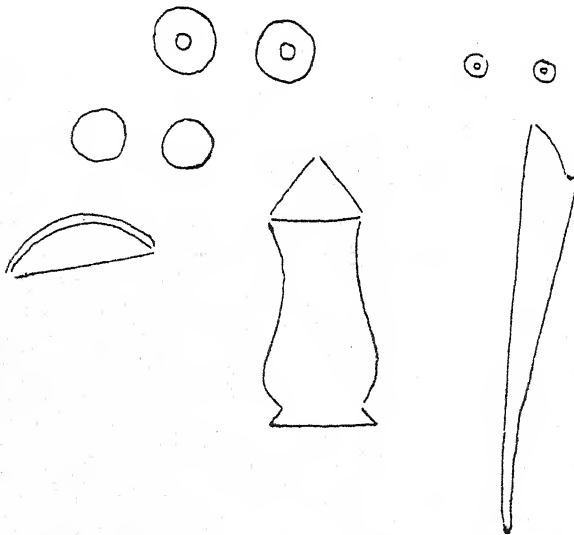


Fig. 8. Designs on a Bolasan monolith.

north-west of the group was 4 ft. 4 inches high and 15 ft. 3 inches in circumference in spite of a damaged top, and the greatest circumference of another was 16 ft. This group is spread along the flattish shoulders of what is at present an open grassy spur, and not at the top of any conspicuous height. On the saddle between the monoliths and the main ridge is a pair of tanks each 40 ft. square with an embankment 10 ft. wide between them, and an artificial mound close by (Plate 25.).

The Derebora monoliths are to the north-east of the groups already mentioned, and are perhaps the most ancient of the male type. Any how they differ from those of Kobak and still more from those of Bolasan in having very large cavities in the tops (Plates 24, Fig. 2; and 26). They must be very ancient as they are well sunk in the ground, at least one being so

deep that the bridle path has gone across the top of it, the edges of the cavity having been cut down to level the path (Plate 23, Fig. 2.). This site is among trees, which could account for additional earth formation, the others being in open country and Bolasan in particular on poor thin soil growing grass which is burnt annually. The Derebora group appears to

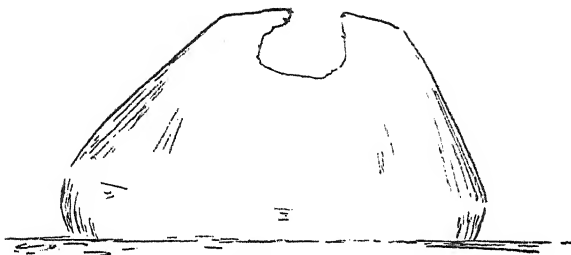
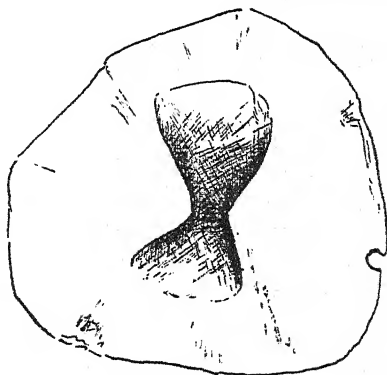


Fig. 9. Cleft monolith at Malangpa.  
(a) from the side.

consist of 42 stones arranged in parallel lines, with one much bigger monolith at a distance from the rest (Plate 27.). One stone measured 16 ft. in circumference, another 17 ft. 8 inches, with a diameter of 1 ft. 8 inches across its opening. The solitary big stone measured 23 ft. 7 inches round its greatest circumference and the depth of the cavity hollowed out in it is 5 ft. 3 inches, while from the lip of this cavity to the circumference was 4 ft., the mean diameter of the aperture being 1 ft. 11 inches. Near by are the remains of a tank and what appears to have been a "dissolith" consisting of a small menhir and a flat stone at its base.



(b) from above.

Before it is possible to arrive at a conclusion as to the origin and purpose of these remarkable monoliths, it is necessary to examine shortly certain concomitant features of the neighbourhood, for the monuments described are not the only monolithic survivals of this area. At Malangpa, where there are a few of the pear-shaped monoliths in bad preservation, there is one of a slightly different type, having a cleft top, while one of the others seems to have been deliberately broken to make

into a round sitting-stone of a type described below. At Malangpa, again, are twin tanks as at Bolasan, while further on towards Kartong are more twin tanks and a knoll with a hollow at the top and what appeared to be the remains of

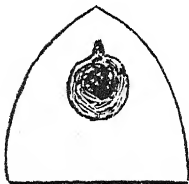


Fig. 10.

a circle of small stones with a single menhir outside it. The situation of the stones in the hollow top of the knoll is very suggestive indeed of the Jaintia Hills.<sup>1</sup> Between Malangpa and Kartong are several menhirs of a rather unusual type, being flat on one side and rounded on the other, rather the shape of a cricket bat. Some of them bear rough carvings which are not necessarily of the date of

the menhir's erection, one of crude elephants, another of female genitalia. The latter, which is one of three in close proximity, has twin tanks close by and single tanks are scattered all about the ridge. Between Kartong and Waichong, again, there appears to have been a row of these cricket-bat menhirs, all now fallen and broken, in association with sitting stones such as those described below. Two of these fallen menhirs are incised with a conventional human figure much like that on a monolith of the ordinary flat type near Kartong, and suggestive of the typical Nzemi (Kachha Naga) representation of a man<sup>2</sup> (See Plate 17, Fig. 3). One of these also bears a mithun's head incised upon it. The stones, near Malangpa, are associated in tradition with a young man named Lamir of great strength equal to that of 10 to 24 men.

The sitting stones have been already referred to. Stones of this description are scattered all about the area in which the monoliths occur. Generally speaking they consist of a circular stone flat on the top but convex underneath, the convex side resting on the ground and the whole propped up with smaller stones round the edge. A few of these stones bear carvings—rough incisions representing in outline, human foot-prints (frequent), fish (one or two instances), a frog (one instance), a mithun (one instance) and what are probably heavenly bodies. These carvings are, of course, not necessarily contemporary with the erection of the stones, and the one of a frog was on a stone just outside the Naga village of Ginare. These round sitting stones, however, are of a type that belongs definitely to the Khasi and Jaintia Hills<sup>3</sup> and the carvings of

<sup>1</sup> *vide* Journal Asiatic Society of Bengal, *Megalithic work in the Jaintia Hills*, Vol. XXII, 1926, p. 334.

<sup>2</sup> *vide* Mem., A.S.B., XI, *Tours in Unadministered Area East of the Naga Hills*, pl. 2, fig. 9.

<sup>3</sup> See Journ. Asiat. Soc. of Bengal, 1844. *Notes on the Kasia Hills, and People* (Yule).

fish and frog suggest the Synteng clans which claim an origin from these animals. The mithun, on the other hand, would seem

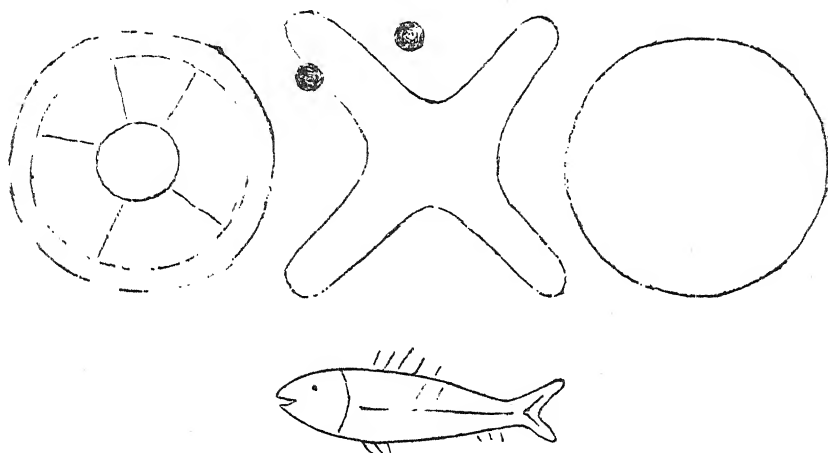


Fig. 11. Designs on sitting stones.

to belong to a later culture. Wild mithun (*gaur*) still frequent the neighbourhood and used to abound there, indeed we were

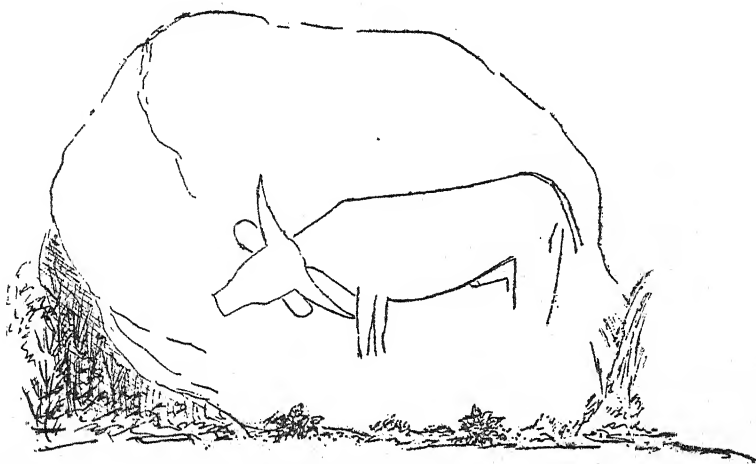


Fig. 12. The mithun rock.

so close to a herd in the long grass one day that we could smell them, but the carved mithun on the sitting stone mentioned and



another on a smooth outcrop of rock between Kartong and Kobak are unmistakeably the domesticated variety (*gayal*), an animal which is not kept by the Khasi and which is typical of Kuki culture, though it has in most part of the Naga country displaced the buffalo, which latter animal, however, is still the one mainly kept and used for sacrificial purposes by the Nagas of this monolithic area (Pltea 17, Fig. 4.). In one case a round sitting stone was definitely connected with a long iron dao which was kept under an adjacent tree and caused storms and sickness if moved, but the dao could not be found when the spot was visited. A large flat rock was found beside the path incised with a fragmentary female figure—the head and breasts and pudenda; also with a footprint.



Fig. 13. Designs on an outcrop of rock.

Single tanks are met with at frequent intervals throughout the area of the monoliths, but they may have been necessary for the water-supply of the people who lived on these far from well-watered ridges. The twin tanks, however, must have had some ceremonial significance, some of them are circular, more are square, but always the pair are close together, of equal size and separated only by a

narrow strip of unexcavated land. Near Kobak there were five such pairs within a short distance of one another. These twin tanks are called *lamjol*, i.e., 'dancing places,' by the local Kukis. At Dimapur, in the neighbourhood of, but not immediately associated with the carved monoliths there, is a fine pair of tanks vastly bigger than those of the North Cachar Hills and known as the 'Twin' or 'Pair Tanks' (*Jura-pukhri*). These pairs are probably all to be explained as having fertility significance on the principle, laid down by many of the Naga tribes, that a pair is the unit of nature, a principle followed in the erection of monoliths, in the appointment of village priests, and even by chiefs in founding new villages, the Sema chief always taking with him a friend to go with him "as

it were man and wife," a practice which has given rise to dual chieftainships. The Khasis, it is to be noted, dig two shallow tanks at the ceremony of the collection of the remains of all the clan in a common burial place.

At Kalimkhu, an eminence near Kartong is the remains of a strong fort said locally to have been built for a Synteng chief named Sajar about five hundred years ("seven lives") ago.

Throughout the area of these monoliths stone adze-heads are found, one type of which is very markedly shouldered (Pl. 20, Fig. 2.). These implements are

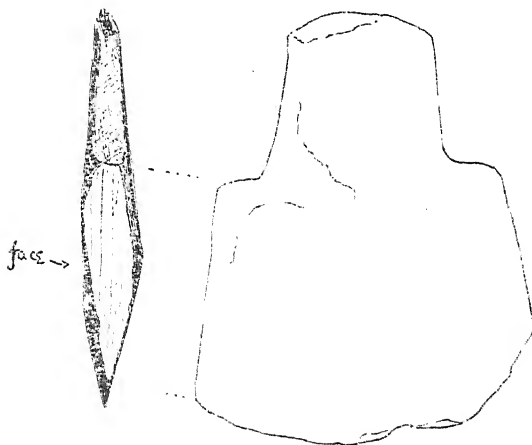
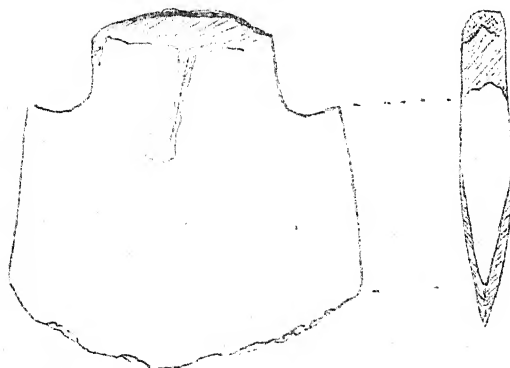


Fig. 14. (a) Stone celt from Ramji.



Back.

(b) Stone celt from Waichong.

in some cases so carefully shaped as to suggest that they have been derived from a metal original, suggesting the little curved and hollowed shouldered iron hoe used by the Yimtsung Naga tribe<sup>1</sup> or the smaller Khasi

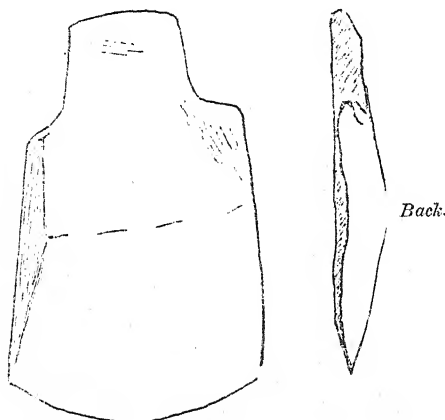
hoe which is used for sweet potato patches. The other type found is probably an axe rather than an adze and is flat and particularly triangular, differing much from the prevailing type

<sup>1</sup> V. The Sema Nagas, Index I, s. v. *tafuchi*.

of stone implement found in the Naga Hills, which is thick and very roughly shouldered and nothing like so carefully finished as these North Cachar implements. Many of the latter stone implements now to be obtained from Nagas or Kukis have been scraped and otherwise damaged in order to use the scrapings as medicine.

In Muchidui near Bolasan is the finest dolmen tomb we have yet seen in the hills of Assam. It is, however, recent and contains the mortal remains of one Heoding, whose son, a very old man still lives in the village.

It remains to consider who erected these monoliths, and for what purpose. The present inhabitants of the country are Nagas

*Back.*

(c) Stone celt from Kobak.

and old Kukis (Hrankol or Biete) and it is clear that the monoliths were not erected by them or their ancestors. Local tradition in some cases speaks of them as Mikir work, and in others as that of Khasis, but does not distinguish between one kind of monument and another. There is in favour of a Mikir origin the fact that the hollow monoliths and twin tanks appear to have a certain cultural connection with Dimapur, and that the Mikirs claim connection with the people who erected the Dimapur monoliths. The association with both the carved and hollowed monoliths and with the sitting stones of the long two handed iron dao might be either Khasi or Mikir, for both used the long iron dao in the past, as also did the Ao

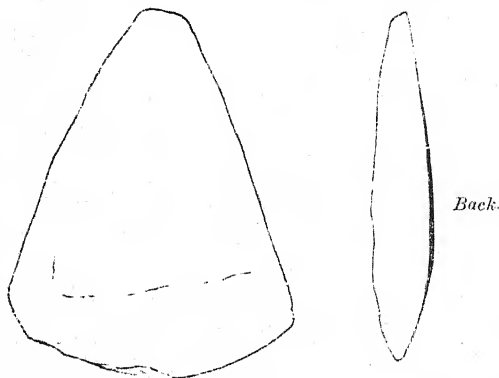
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Fig. 15. Celts from Gunjong.

Nagas, who attribute such daos to a previous race called Molungr and who also speak of bulbous wooden phallic posts set up outside their houses as *Molungsongsong*. It is probable, however, that these traditions among Nagas and Mikirs of a prehistoric culture of which phallic memorial posts and the two handed iron sword were typical, must be referred to some general culture which pervaded Assam before the influx of the Tibeto-Burman speaking tribes from the northeast or the Hindus from the southwest and which was very likely indeed a Mon-Khmer culture<sup>1</sup>. This, however, does not involve our regarding the existing tribes, all of mixed blood, probably, who have traditions of the existence of that culture, as the direct representatives of the people who put up the monoliths.

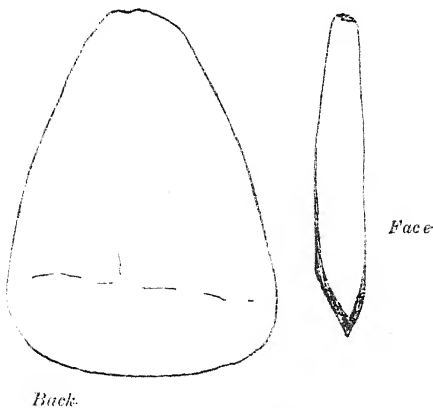


Fig. 16. Celt from Ndunglo.

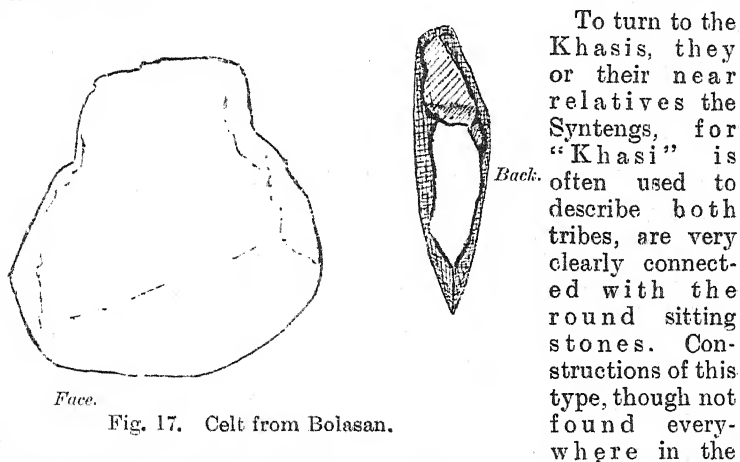


Fig. 17. Celt from Bolasan.

To turn to the Khasis, they or their near relatives the Syntengs, for "Khasi" is often used to describe both tribes, are very clearly connected with the round sitting stones. Constructions of this type, though not found everywhere in the

Khasi Hills, as the rectangular dolmen type is the prevailing one, are recorded and depicted by Yule and mentioned by other observers<sup>2</sup>. The "cricket bat" monoliths, though distinctly

<sup>1</sup> It is perhaps a coincidence that the Konyak Naga village of Mon is known to the Assamese as Molung.

<sup>2</sup> Yule, *Notes on the Kasia Hills, and People*, Journ. Asiat. Soc. of Bengal, 1844, P. 612 *sqq.* and plate II

suggestive of the flat carved monoliths at Kasomari<sup>1</sup>, are likewise probably Khasi or Synteng, since they were found in close association with the sitting-stones. If the prevailing menhirs and dolmen stones of the Khasi and Jaintia Hills are of rough stone and irregular in shape, this discrepancy is perhaps to be ascribed to the fact that whereas the North Cachar Hills yields a soft stone easy to work, the prevailing stone in the Khasi and Jaintia Hills is a hard granite. The local tradition that the line of dressed standing and table stones along the path from Kobak to Waichong occupies a site that was formerly a market, not only suggests the similar tradition of the carved monoliths at Dimapur, but links up with the actual surviving practice in the Jaintia Hills, where among the rough stone monoliths and table stones at Nartiang a weekly market is still held as it has been since the time of the Jaintia princes and probably for at least the last five hundred years. The Synteng associations of fishes and frogs carved on sitting stones has already been mentioned; the same associations are probably to be attached to carvings of the heavenly bodies, representations of which are still pointed out in the Jaintia Hills. The carvings of mithun on the other hand seem antagonistic to any association with the Khasi or Syntengs. Mithun appear to be typical of the Kuki-Kachin culture, a late immigrant into Assam, and to have displaced the buffalo, which was till then, as it still is in parts of Assam Hills, e.g., the Konyak Naga country and the North Cachar Hills themselves, and as it still is in the Philippine Islands, the animal reserved for sacrifice and generally associated with ceremonial. We are therefore inclined to regard the carvings of mithun as later accretions, and not contemporary to the erection of the monoliths. The same might possibly apply to the human figures, which occasionally occur on the "cricket bat" menhirs. It was perhaps the advent of mithun keeping people that caused the makers of dressed monoliths to migrate. Head-hunting, if that is to be inferred from the heads round one of the Kobak hollowed stones, might belong to any of the tribes named, though we do not remember that it is actually recorded of the Mikirs. The carving of foot-prints on stones is a wide-spread Indo-Chinese custom, and in Assam is to be seen at Sangnyu in the Konyak Naga country and on stones carved by Manipuris, who have at any rate physical traits in common with the Syntengs as well as some cultural ones such as the marketing habit<sup>2</sup>.

The particular purpose of the monoliths is a more difficult question. The upright menhirs and the sitting stones must be

<sup>1</sup> Journ. Royal Anthropological Institute, Vol. LIII (1923), *Carved Monoliths at Jamuguri in Assam.*

<sup>2</sup> Vide Journ. Asiat. Soc. of Bengal, *Some Megalithic work in the Jaintia Hills*, Vol. XXII, 1926, No. 6, P. 335.

interpreted in the light of Khasi, Synteng and Naga monoliths and dolmens as providing phallic memorials through which the soul matter of the living or of the dead assists the fertilization of nature, the upright stone representing the male and the flat ones the female principle. No doubt the hollowed stones are to be referred to the same general principle, but the toil and care with which they are hollowed, sometimes to such an extent that the stone rings on being struck, suggests that these hollows were made for some very definite purpose. Here we are reduced to speculation. Many of them actually held water when we saw them and it would be reasonable enough to suggest that by constructing them to hold water the makers hoped to promote the rainfall, much in the same sort of way as a Rengma Naga digs a hollow on his father's grave in order that it may fill with rain and cause a good monsoon and abundant crops. Or, again they might have been made to contain offerings, given to obtain specific benefits, and an analogy might be offered in the apparently recent or comparatively recent holes scooped out in ancient monoliths at Kasomari<sup>1</sup> seemingly for this purpose. Neither of these suggestions quite satisfies us. Many of the cavities in the Bolasan stones seem too small for the former purpose and many of those at Derebora unnecessarily large for the latter. The stones at Kartong strongly suggested to one of us the phallic skull cists of the Konyak Nagas of Wakching, Wanching and Kongan, but many of the monoliths at Bolasan have cavities too small to take a skull with any comfort, though those at Derebora are as capacious as the pots used for the skulls of Konyak Chiefs further north or for the skulls and bones of the dead placed in their granaries by the Nagas of Laruri. On the whole we have come to the tentative conclusion that the hollow monoliths of the North Cachar Hills contained the ashes of the dead. The burning of the dead is practised by the Mikirs, the Sakchips (Tipperas), Hrangkols, and other old Kuki tribes which probably represent a mixture of the earliest immigrants of the Kuki race with the people who occupied Assam before them. The Khasi and Synteng not only burn their dead, but at a periodic tribal festival collect the ashes of the tribal dead into a common burying place<sup>2</sup>, where the remains of the men and of the women are disposed of apart in pots in a stone chamber. Further the War of Shella<sup>3</sup>, a tribe belonging to the Khasi-Synteng group but regarded as in some measure distinctive in their customs, use as a preliminary depository for these ashes a hollow made in a wooden post, and our experience of the Naga Hills leads us to expect to find corresponding forms in

<sup>1</sup> *Carved Monoliths at Jamuguri in Assam*, J.R.A.I., LIII, P. 154; *Some carved stones in the Dayang Valley, Sibsagar*, J.A.S.B., XX, 1924, No. 5, P. 146.

<sup>2</sup> Gurdon, *The Khasis*, pp. 134, 140 sqq.

<sup>3</sup> *ibid.*, p. 137.

wood for monoliths in general. The custom of the Khasi and Synteng generally<sup>1</sup> is to collect the ashes of the dead temporarily in stone dolmen cists, transferring them later to the common cist of the family and thence to the clan burial place in a ceremony of much importance which is probably no longer performed. We suggest that the excavated monoliths of the North Cachar Hills served a purpose of this kind, in which case the great monolith separated from the group at Derebora no doubt held the ashes of the chiefly family or was perhaps the final destination of the ashes of the whole clan. It may be that the difficulty of excavating granite into similar forms led to the substitution of dolmen cists containing pots by the Khasis and Syntengs.<sup>2</sup>

In any case the North Cachar hollowed monoliths must represent a rather specialized development of a phallic ancestor cult typical of Assam, widely spread in South East Asia and extending even to Oceania and Madagascar. If we are to impute their erection to the ancestors of the Mikir tribe we must explain the disappearance of the custom as the result of racial invasion and upheaval which have left the Mikirs isolated in small communities and degenerate in cult. No Mikir community now-a-days is numerous enough to undertake the erection of any large monoliths. It is more probable, however, that this type of monolith is to be associated with the Khasi Synteng group of tribes and that it has disappeared owing to their migration into an unsuitable environment of untractable materials. In any case the cult appears in the North Cachar Hills fully developed, and we have no indication of its growth. A single stone, obviously of phallic significance and having a small hole at the top, has been found by Mr. Calvert in the extreme east of the Cachar Hills on the Manipur border, but it would be rash to infer a definite connection with the hollow monoliths. No doubt their prototypes were fashioned of wood and have therefore long since perished.

<sup>1</sup> That is of the few that remain unconverted to Christianity. Ancient customs are vanishing very fast from the Khasia and Jaintia Hills.

<sup>2</sup> Since the above was written, Mr. Calvert has discovered at the bottom of the cavity of one of the Derebora monoliths a few fragments of thin mineralized bone suggestive of part of a skull. This forms a very strong confirmation of our theory associating these monoliths with the disposal of the dead.

With reference to these fragments Sir Arthur Keith, who very kindly examined them for us, writes as follows:—

“The bones you sent home are of one person and from the size of the fragments the individual may have been a woman or a small man. I think a woman. She had been cremated as you observed. No animal fragments are present. The hard mineralized condition is not due to the age or fossilization—just the hardness and mineralization which follows cremation.”

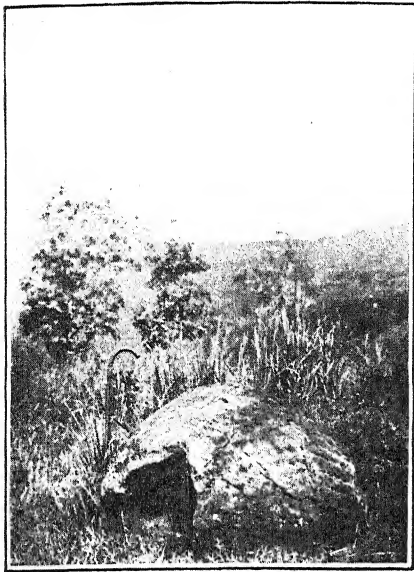


Fig. 1. Monolith at Ndunglo.

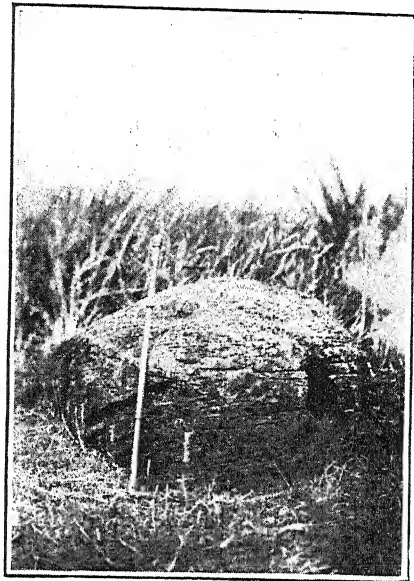


Fig. 2. Monolith at Ndunglo.



Fig. 3. "Bat" monolith carved with human figure between Kartong and Waichong.

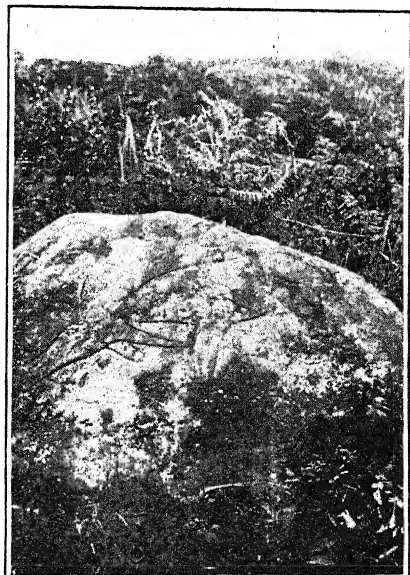
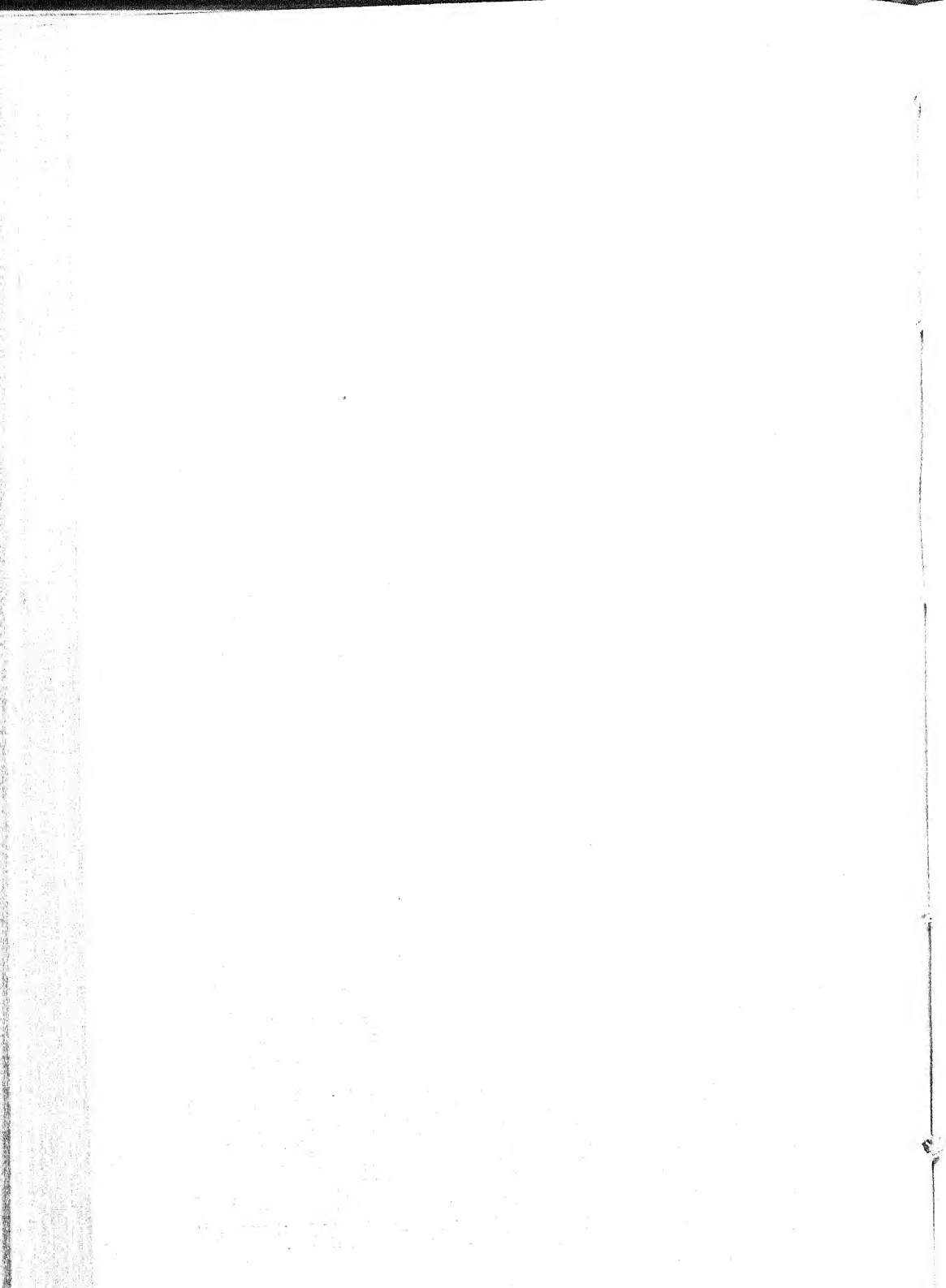


Fig. 4. The mithun rock between Kartong and Kobak.





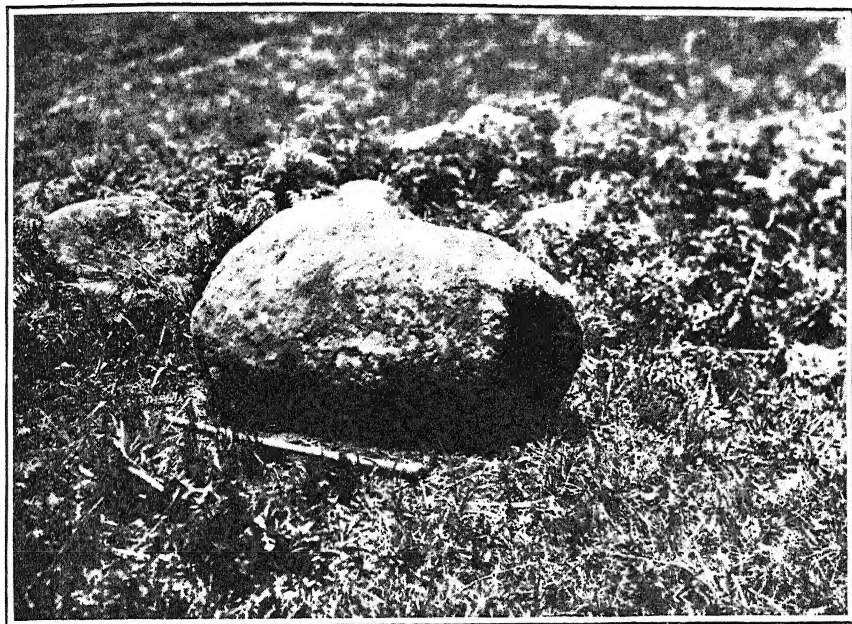
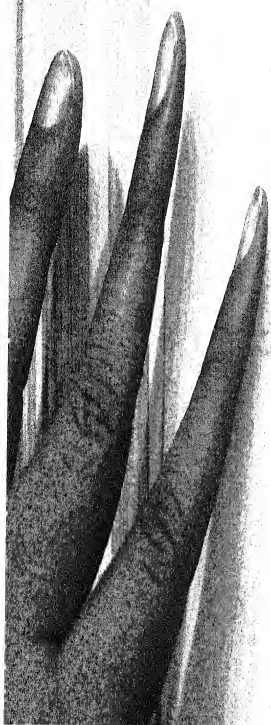


Fig. 1. Monolith at Kartong.



Fig. 2. Monolith at Kartong.



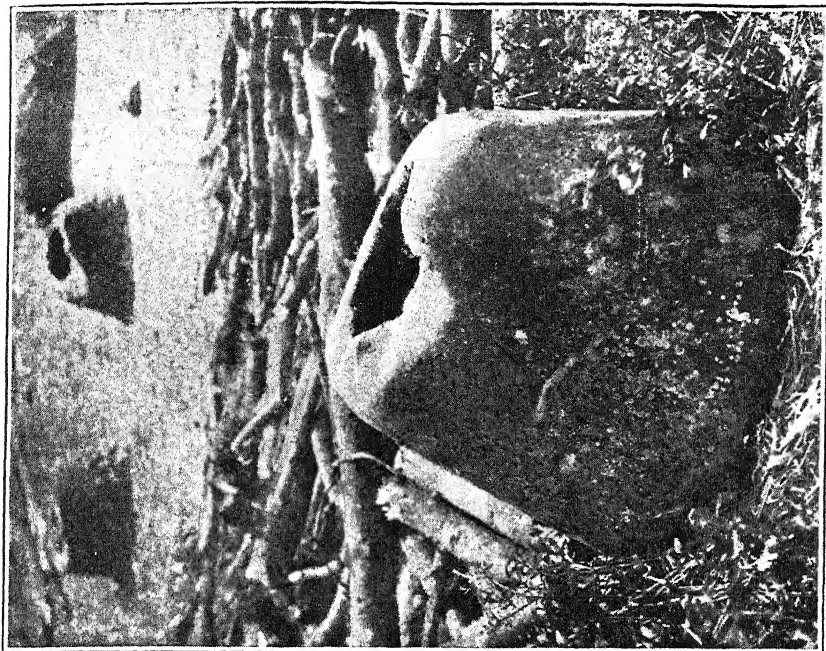


Fig. 2. Monoliths at Kartong.

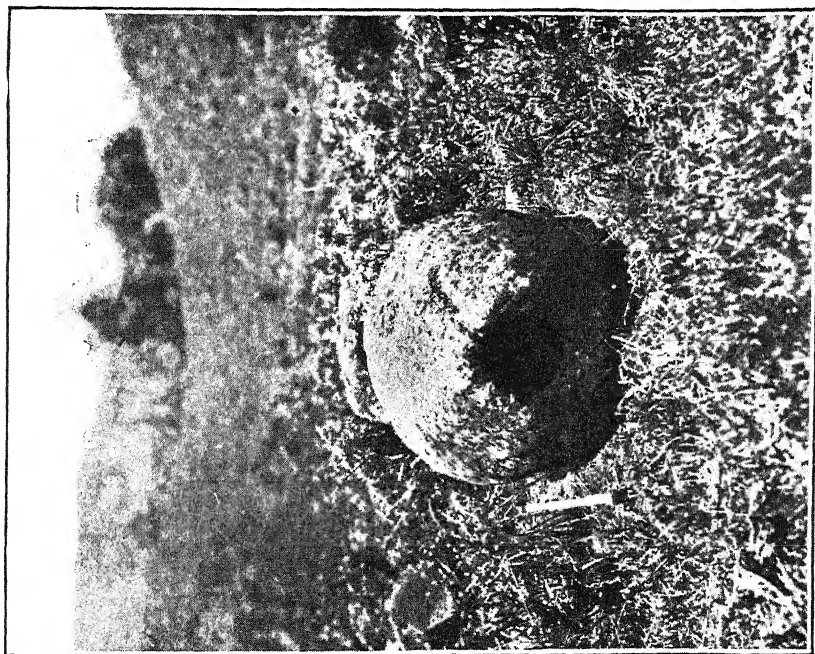


Fig. 1. Monolith at Kartong.

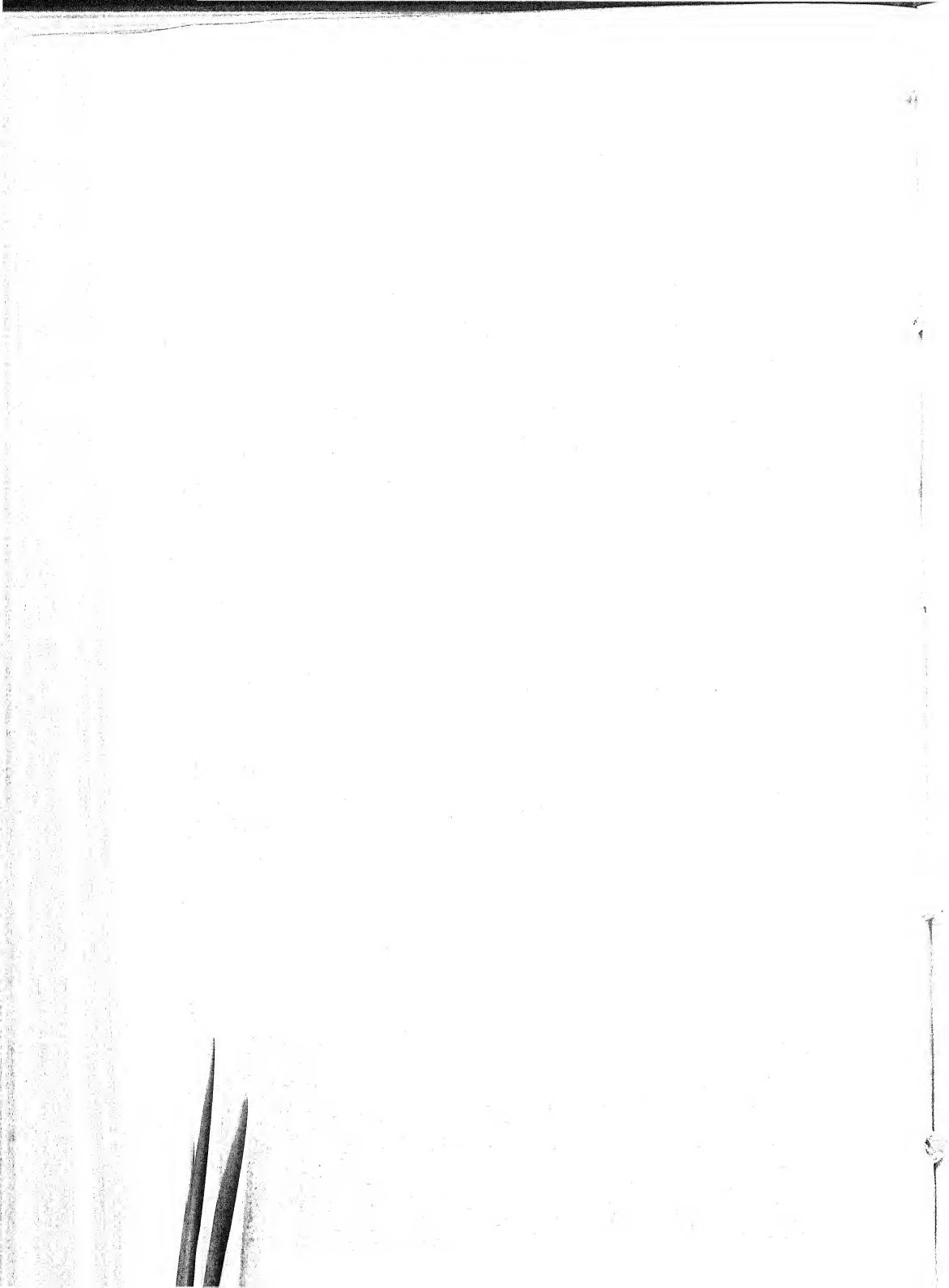




Fig. 1. Small monoliths at Kartong made from fragments of more ancient hollowed monoliths.

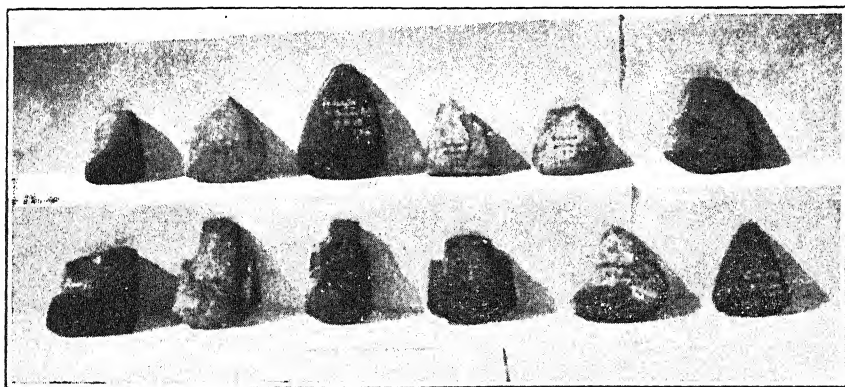


Fig. 2. Stone celts from the monolithic area.

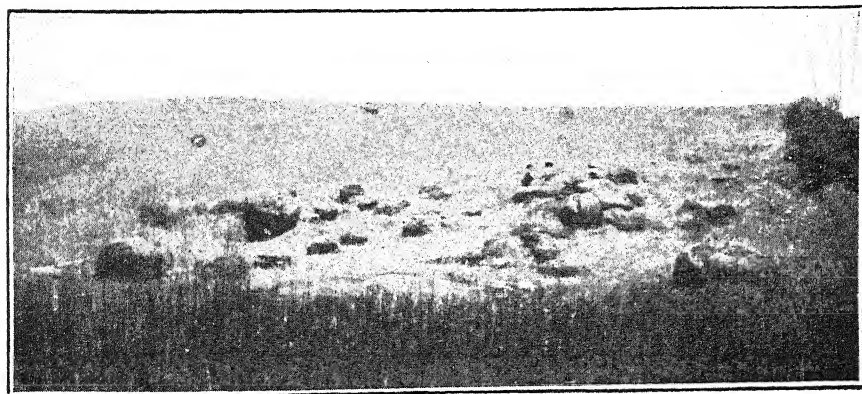


Fig. 3. Monoliths at Bolasan.





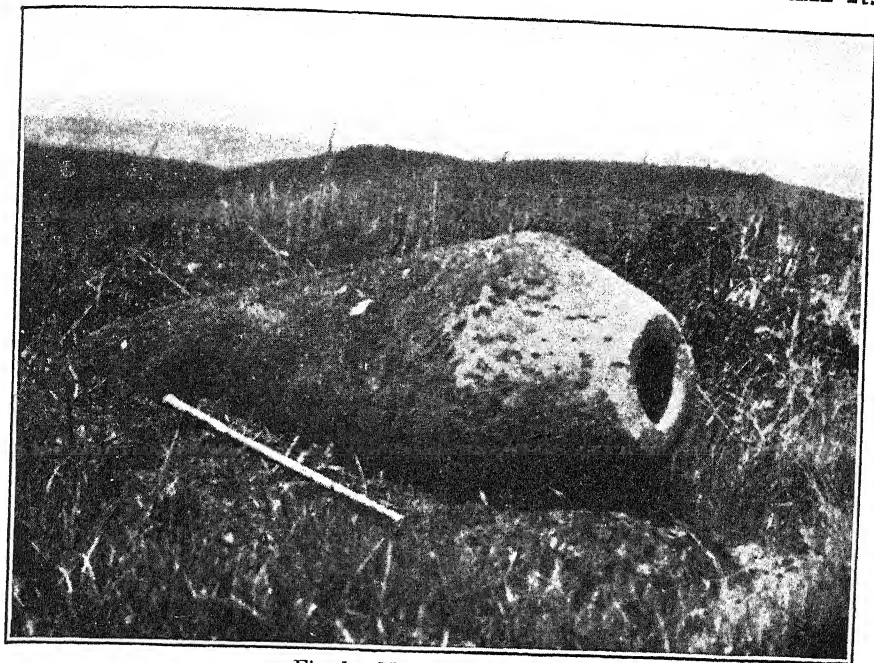


Fig. 1. Monolith at Kobak.

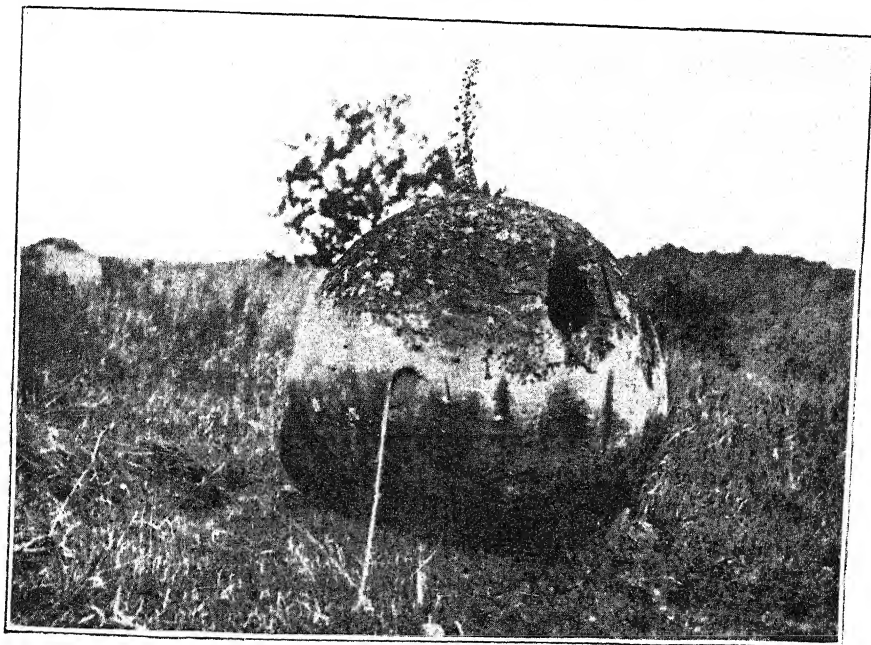
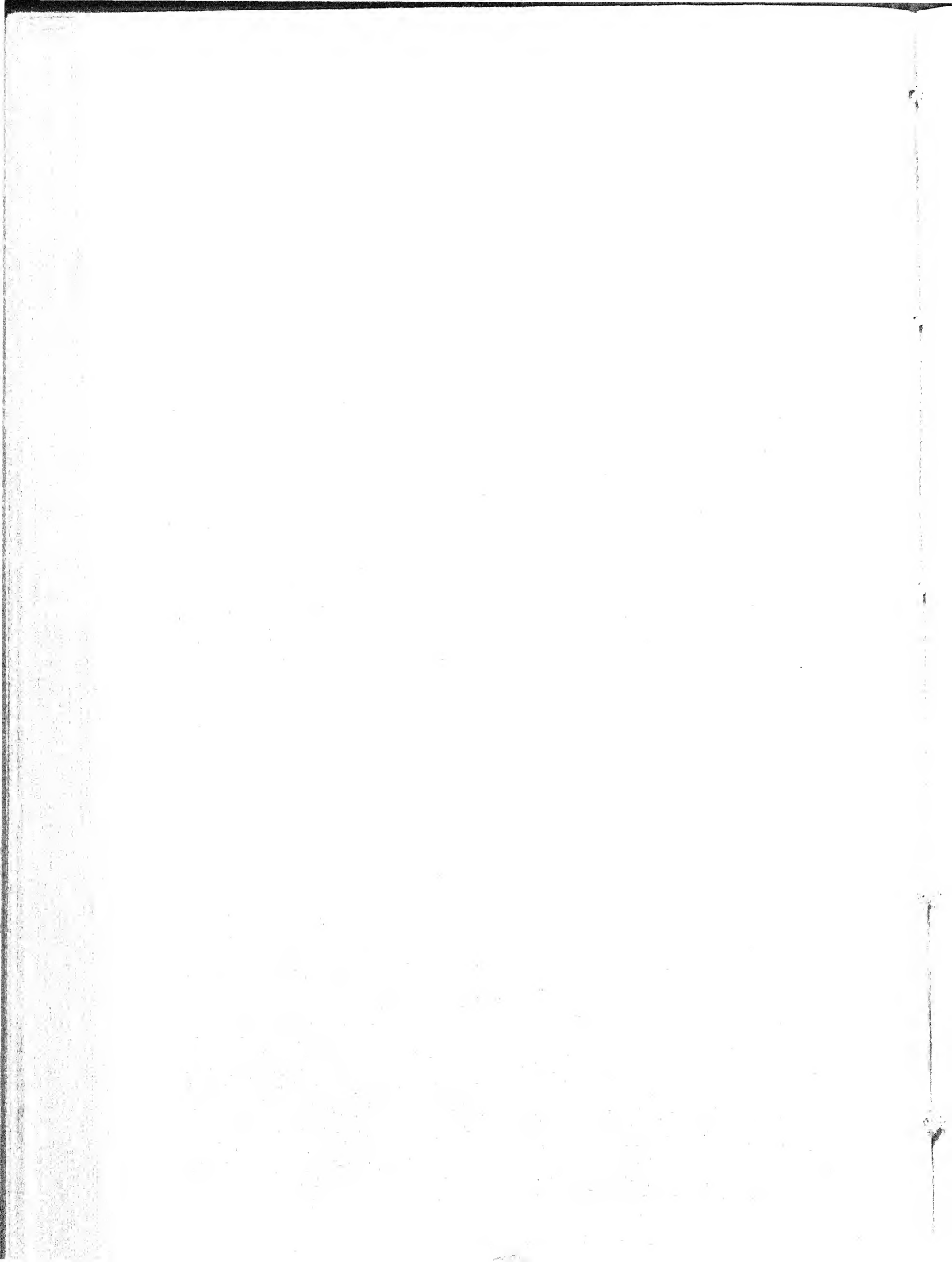


Fig. 2. Large monolith at Bolasan.





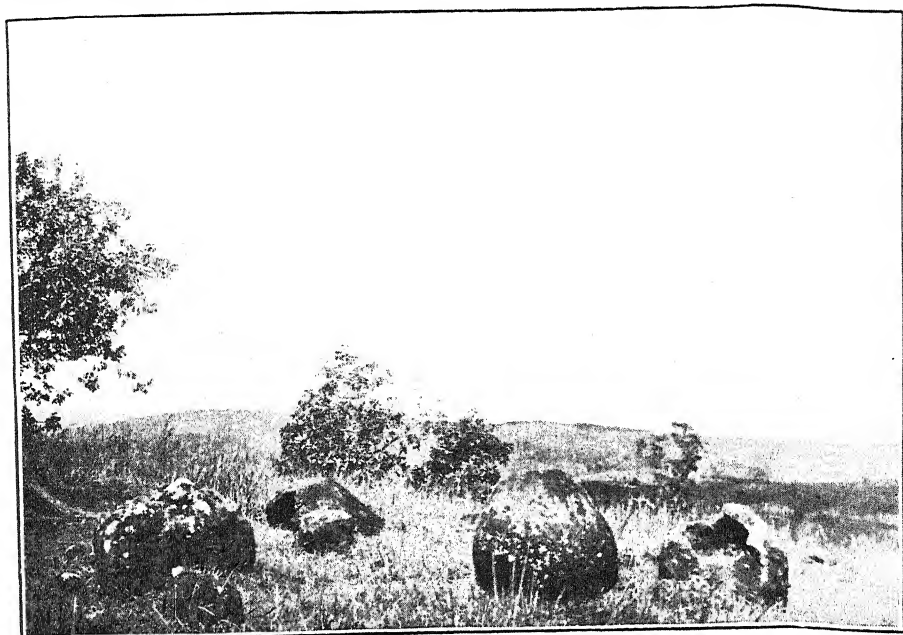


Fig. 1. Monoliths at Bolasan.



Fig. 2. Monoliths at Bolasan.



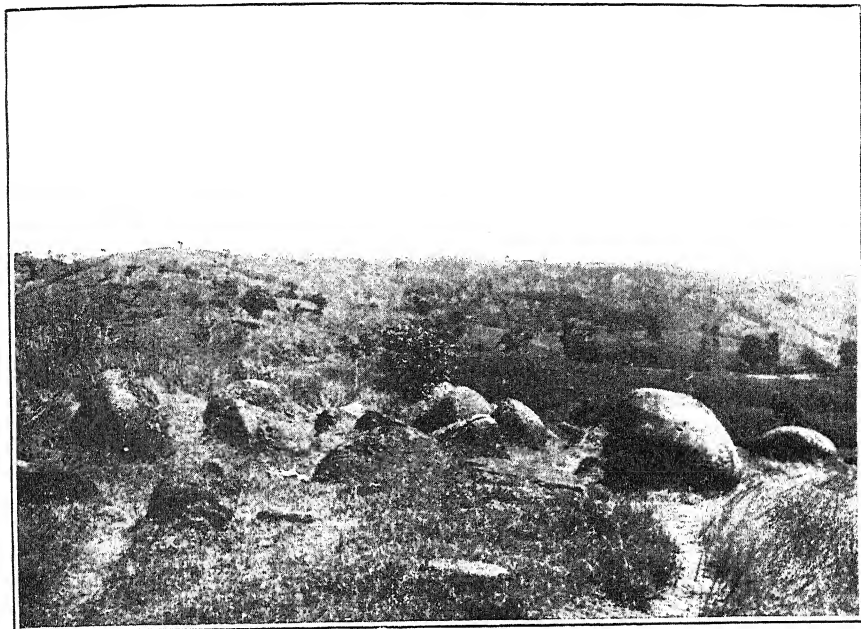


Fig. 1. Monoliths at Bolasan.



Fig. 2. Monoliths near Derebora.

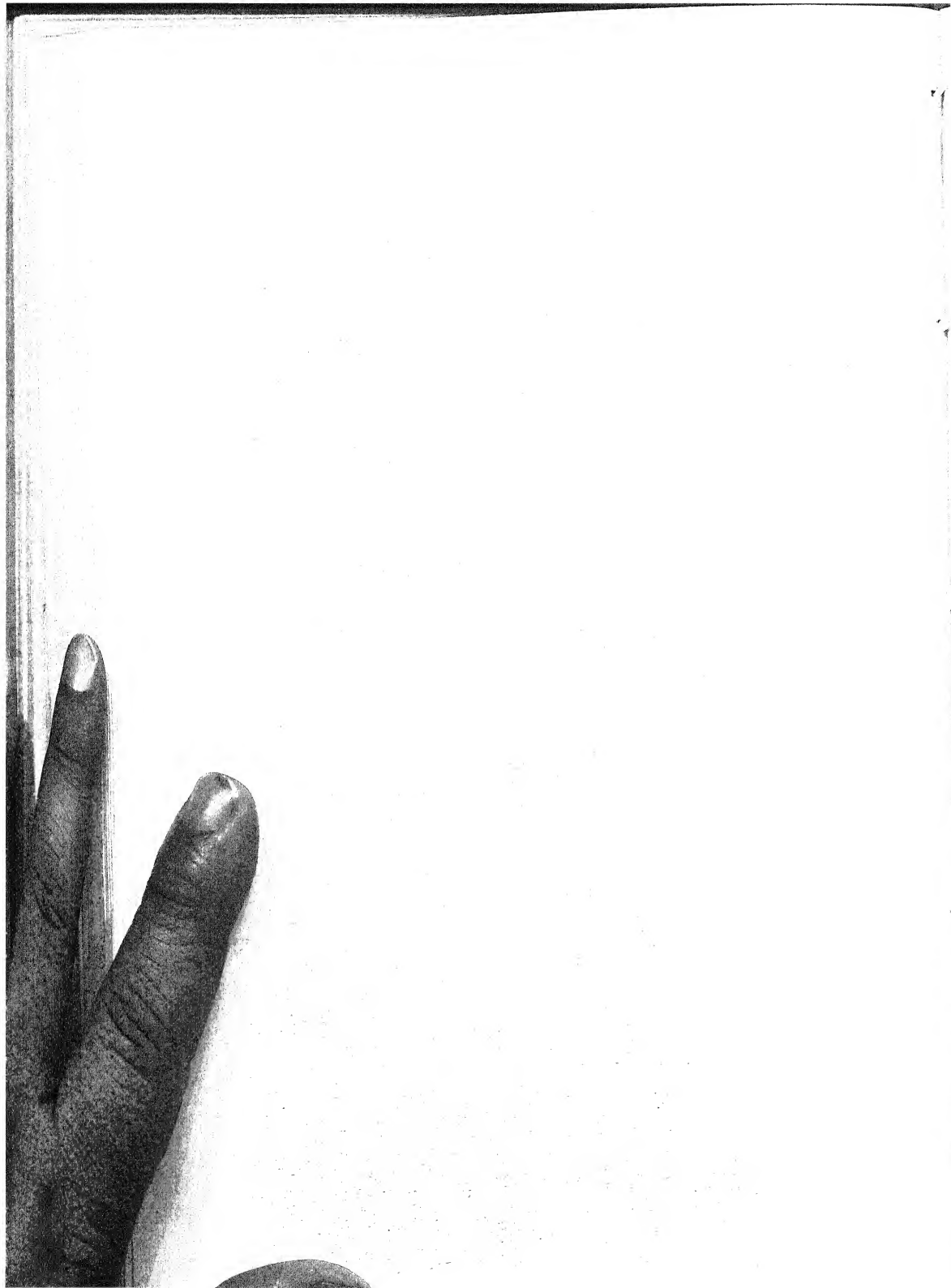




Fig. 2. Monolith near Derebora.



Fig. 1. Small monolith at Bolasan.





The twin tanks at Bolasan.





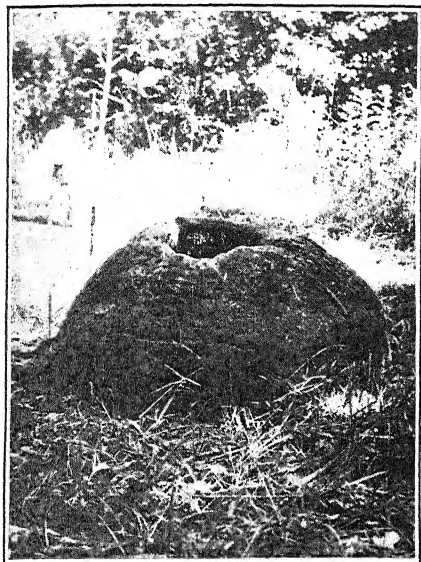


Fig. 1. Monolith near Derebora.



Fig. 2. Monolith near Derebora.

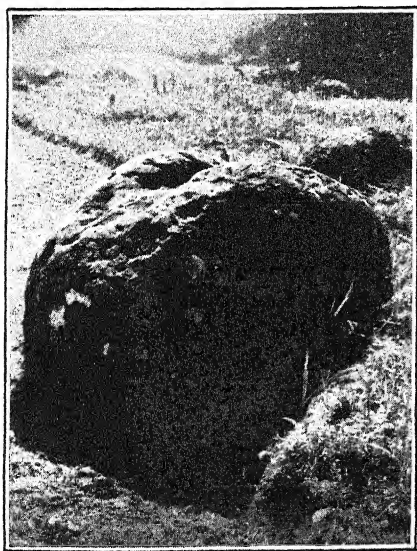


Fig. 3. Monolith by the path near Derebora.

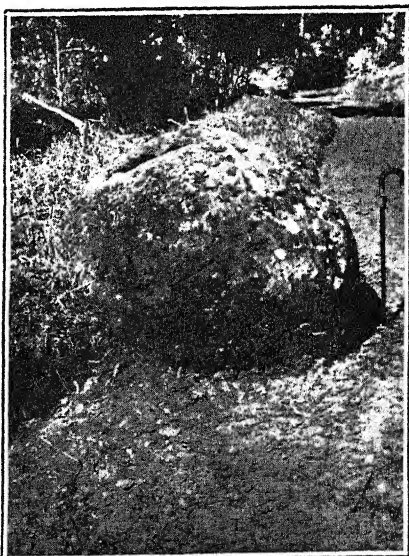
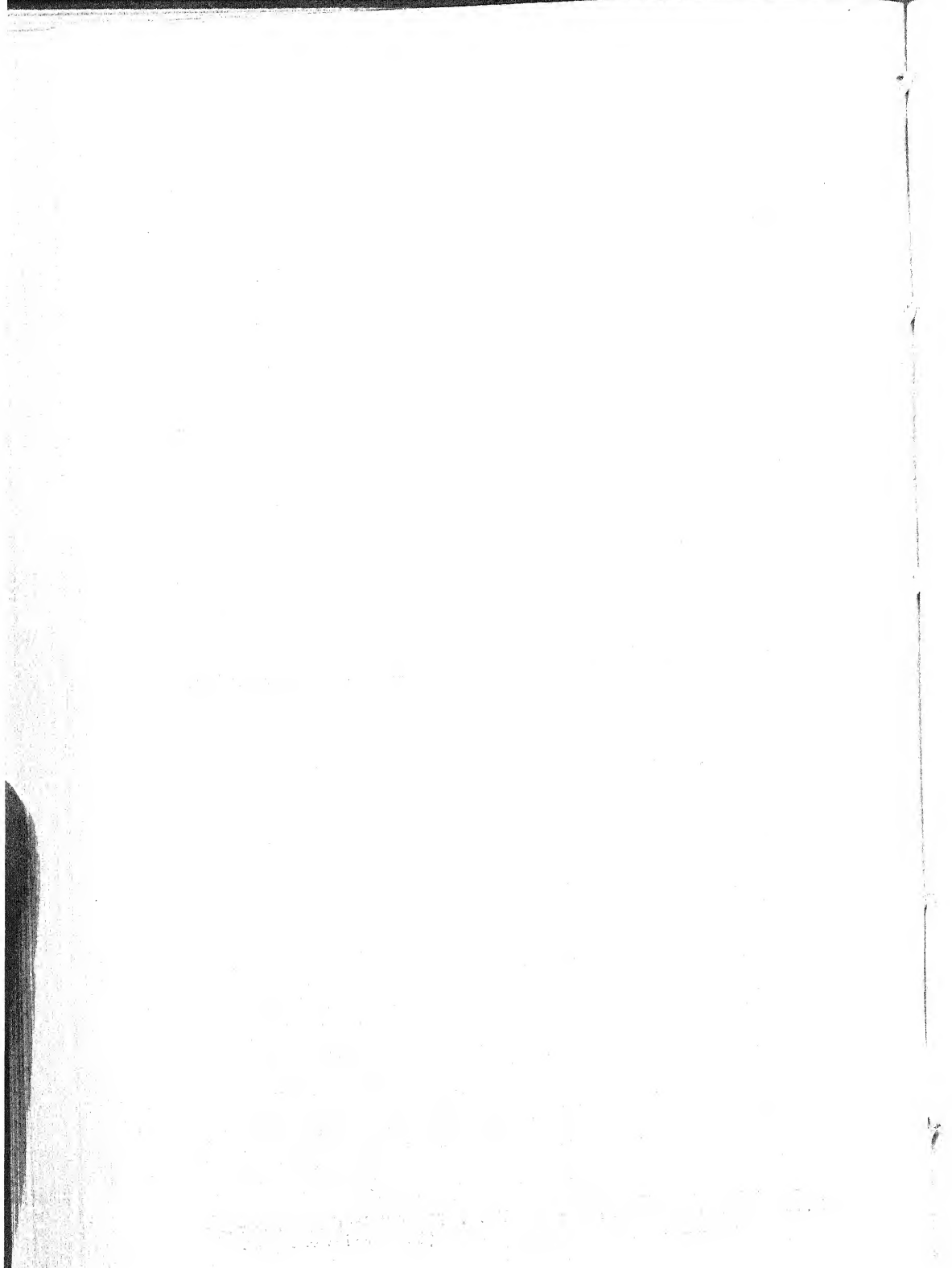


Fig. 4. Monolith by the path near Derebora  
(Another view of Fig. 3).



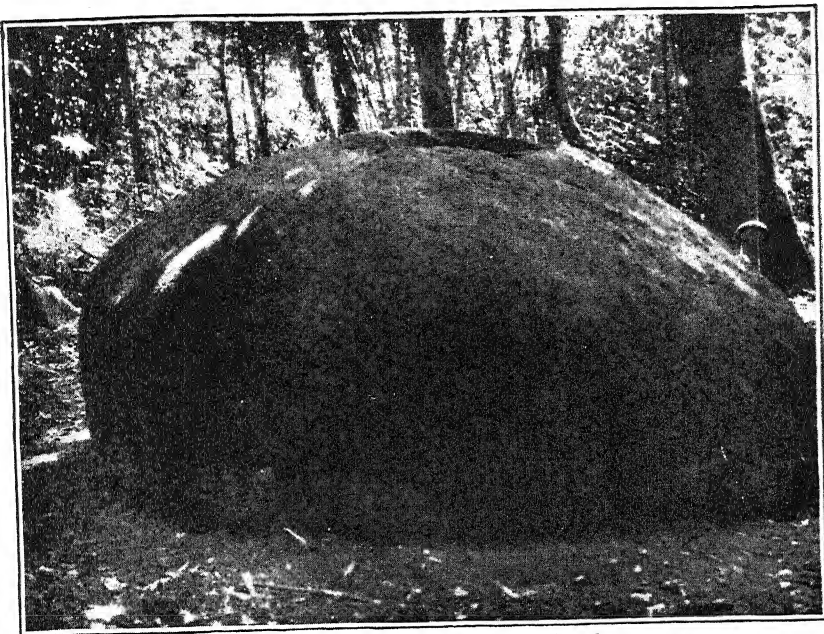


Fig. 1. The great monolith near Derebora.

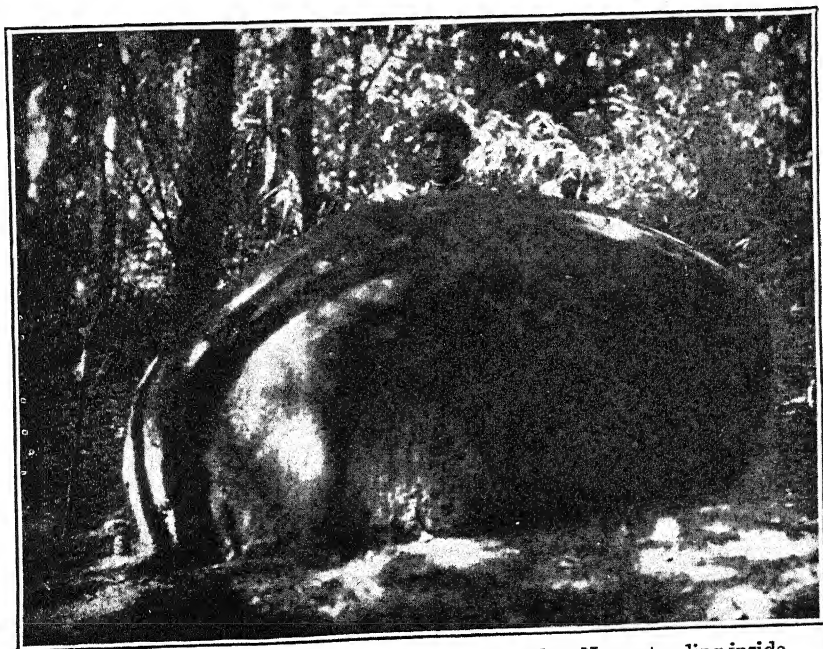
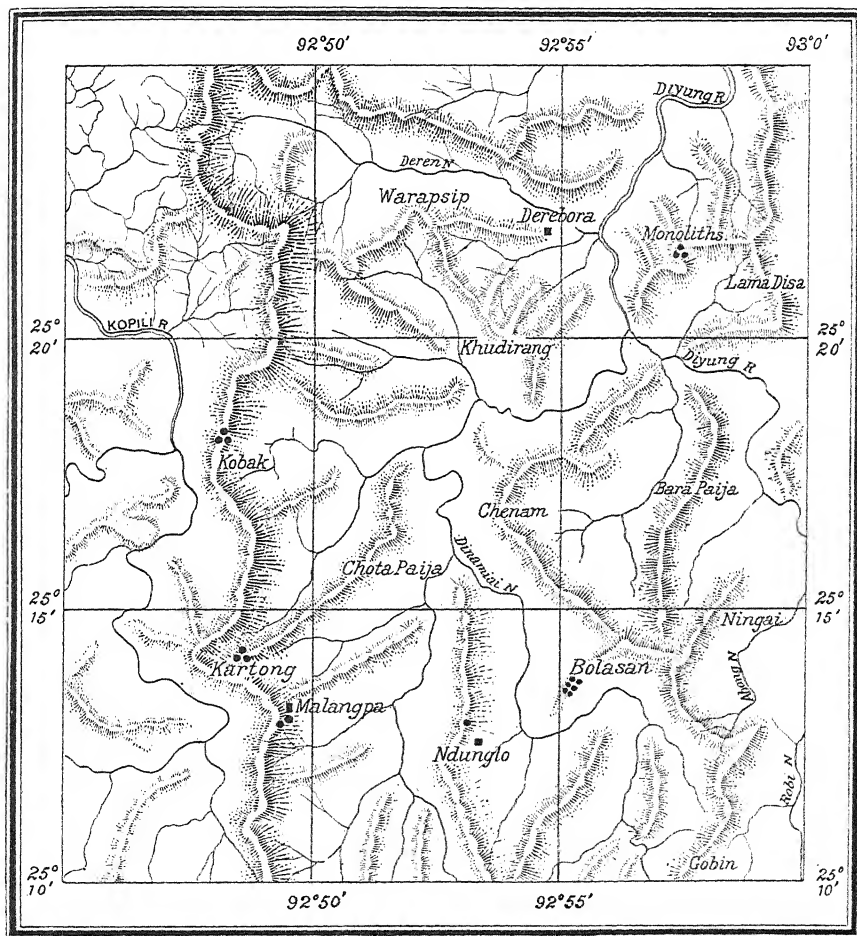


Fig. 2. The great monolith (Fig. 1 above) with a Naga standing inside.





Map of part of the NORTH CACHAR HILLS showing sites of excavated  
monoliths, thus :—

Scale : 1 inch=4 miles.



**A contribution to the Chemistry of certain new  
aromatic Antimonials.**

UPENDRA NATH BRAHMACHARI and JNANENDRA MOHAN  
DAS GUPTA.

The study of organic antimonials has not been so exhaustive as that of organic arsenicals. In recent years some new organic pentavalent antimonials have been prepared and notable among these is urea stibamine discovered by one of us (U.N.B.), which has been found to be of great therapeutic value in the treatment of kala-azar. The reason why much less work has been done with organic antimonials than with arsenicals can be traced mainly to two important causes. First of all, organic antimony compounds are very difficult to prepare and are with few exceptions not crystalline. Secondly, most of them are unstable. This instability limits the formation of various complex antimonials, which has been possible in the case of arsenic. This is especially the case with stibino-benzene compounds as compared with arseno-benzene compounds. Generally speaking, in the case of arsenic, antimony, and bismuth this instability increases as the metallic character of the element becomes more and more pronounced. Thus C-Bi link is less stable than C-Sb link and C-Sb link less stable than C-As link.

The great difficulty involved in the preparation of aryl antimonials is really a barrier against extensive investigations on this type of compound. This difficulty becomes still greater, as minute impurities and slight variations of physical influences affect the stability of the compounds to a considerable extent, thereby bringing about marked changes in their toxicities and therapeutic properties.

In the Indian Journal of Medical Research, the Indian Journal of Medicine, and the Calcutta Medical Journal a series of new organic antimonials were described sometime ago by one of us and some of these compounds have been shown to be of great therapeutic value (U.N.B). Another series of new aromatic antimonials have since been investigated by us in the Brahmachari Research Institute and the following are the first series of such compounds :

1. Disodium p-aminophenyl stibinate-N-methylene sulphonate,
2. Urea-p-amino-phenyl stibinate-N-methylene sulphonate of sodium,
3. Disodium p-stibinilate-N-methylene-sulphinate,



4. Urea p-amino-phenyl stibinate-N-methylene sulphinate of sodium,
5. P-acetyl-amino-phenyl-stibinate of urea,
6. 1-acetamino-2-azobenzene-4:4'-distibinate of sodium,
7. P-hydroxy-phenyl-stibinate of urea.

Some of these compounds as will be seen from their percentage composition given below exhibit strong polymerisation whereby three molecules associate together giving rise to more complex molecules.

#### EXPERIMENTAL.

(1) Disodium p-aminophenyl stibinate-N-methylene sulphate  $3(4\text{-SO}_3\text{Na}\cdot\text{CH}_2\cdot\text{NH}\cdot\text{C}_6\text{H}_4\cdot\text{SbO}_2)\text{H}\cdot\text{ONa}$ .

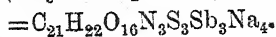
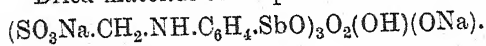
The starting material in the preparation of this compound is stibanilic acid, which has been prepared by Bart's reaction. Stibanilic acid is neutralised with solution of sodium hydroxide and the sodium salt precipitated by absolute alcohol. The precipitate is then thoroughly washed with absolute alcohol till the filtrate is free from alkali. It is next dried in a vacuum dessicator.

Sodium stibanilate is dissolved in water and then formaldehyde solution and  $\text{NaHSO}_3$  dissolved in water are added to it successively in a flask. The mixture is next heated on water-bath and filtered. The filtrate is treated with excess of alcohol when a bulky precipitate is produced which is washed with alcohol and dried in a porous plate in a vacuum dessicator.

The product is a light coloured powder—easily soluble in water to a perfectly clear solution which gives faintly acid test.

Composition :—

Dried material corresponds to the formula :



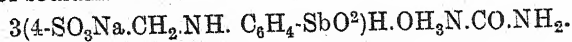
Calculated for  $\text{C}_{21}\text{H}_{22}\text{O}_{16}\text{N}_3\text{S}_3\text{Sb}_3\text{Na}_4$ —S=8.7%, N=3.8%,  
Sb=32.2%

Found

S=8.5%, N=4.0%,

Sb=32.5%

- (2) Urea p-amino-phenyl-stibinate-N-methylene Sulphonate of sodium.



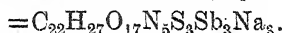
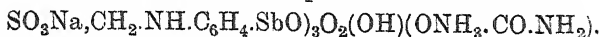
The starting material in this preparation is urea stibamine. Urea stibamine is dissolved in a small quantity of water to which formaldehyde solution and  $\text{NaHSO}_3$  dissolved in little quantity of water are added in succession. A bulky precipitate is formed on adding the constituents. The mixture is warmed

on water bath. It is next filtered and the filtrate precipitated by alcohol. The precipitate is washed with absolute alcohol and then dried over a porous plate in a vacuum desiccator.

The product is a light coloured powder—easily soluble in water and giving a neutral test to litmus paper.

Composition :—

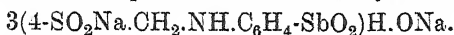
Dried material corresponds to the formula :



Calculated for  $\text{C}_{22}\text{H}_{27}\text{O}_{17}\text{N}_5\text{S}_3\text{Sb}_3\text{Na}_3$ —S=8.29%, N=6.0%,  
Sb=31.1%

Found S=8.1%, N=6.3%,  
Sb=31.7%

(3) Disodium-p- stibanilate-N-methylene sulphinate.

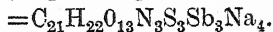
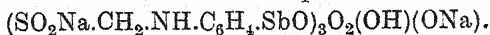


Stibanilic acid is treated with NaOH solution and the sodium salt next precipitated by adding absolute alcohol. The precipitate is washed with alcohol to remove the free alkali. The dried sodium salt is then dissolved in little water and the solution thus obtained treated with sodium formaldehyde sulphonylate dissolved in little water. A bulky precipitate appears and the whole mixture is warmed on a water-bath when a clear solution is obtained with a small quantity of insoluble impurity. The solution after filtration is bit concentrated and then precipitated by absolute alcohol. The precipitate is next filtered and dried over a porous plate in a vacuum desiccator.

The product is a light coloured powder very soluble in water to a perfectly clear solution, giving a neutral test to litmus paper.

Composition :—

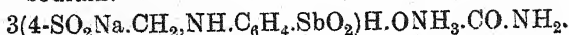
Dried material corresponds to the formula :



Calculated for  $\text{C}_{21}\text{H}_{22}\text{O}_{13}\text{N}_3\text{S}_3\text{Sb}_3\text{Na}_4$ —S=9.0%, N=4%  
Sb=33.7%

Found S=9.4%, N=4.2%,  
Sb=33.5%

(4) Urea p-amino-phenyl stibinate-N-methylene sulphinate of sodium.



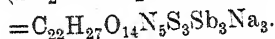
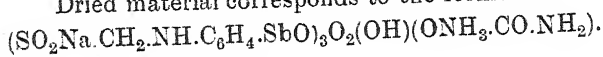
Urea stibamine is dissolved in water to which a solution of sodium formaldehyde sulphonylate is added. A bulky precipi-

tate appears and the whole mixture is well shaken. The mixture is next warmed on a water-bath. A clear solution with a slight sediment at the bottom is obtained which is next filtered. The clear filtrate after concentration is precipitated in cold by absolute alcohol. The precipitate is washed with alcohol, and dried over porous plate in a vacuum dessicator.

The product is a light coloured powder—readily soluble in water to a perfectly clear reddish solution which is faintly acid to litmus paper.

Composition:—

Dried material corresponds to the formula:



Calculated for  $\text{C}_{22}\text{H}_{27}\text{O}_{14}\text{N}_5\text{S}_3\text{Sb}_3\text{Na}_3$ —S=3.65%, N=6.3%,

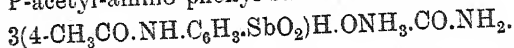
Sb=32.4%

Found

S=3.4%, N=6.0%

Sb=32.0%

(5) P-acetyl-amino-phenyl-stibinate of urea.

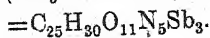
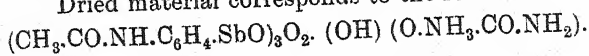


The starting material in this preparation is p-acetyl-amino-phenyl stibinic acid which is obtained from the corresponding acetyl phenylene diamine. The acid is thoroughly washed and the pasty mass is obtained in a semi-dry state by pressing over porous plate. The moist acid is treated with a little urea and then well mixed. The mixture is heated in boiling water when a reddish solution is obtained. A little more water may be added, if necessary, to obtain a clear solution and then warmed. The solution is next filtered through fluted filter paper and the filtrate precipitated by absolute alcohol. The precipitate is well washed with the same and dried over porous plate in a vacuum dessicator.

The product is a yellowish powder and dissolves in water to a clear solution, which is faintly acid.

Composition:—

Dried material corresponds to the formula:

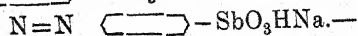
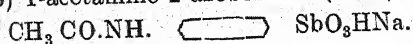


Calculated for  $\text{C}_{25}\text{H}_{30}\text{O}_{11}\text{N}_5\text{Sb}_3$ —N=7.48%, Sb=38.4%

Found

N=7.9%, Sb=38.0%

(6) 1-acetamino-2-azobenzene-(4:4').distibinate of sodium.



The starting materials in the preparation of this compound are acetyl stibanilic acid and stibanilic acid. The former is obtained from acetyl-p-phenylene diamine and the latter by its hydrolysis with alkali. The stibanilic acid is partially dried on a porous plate and suspended in a small quantity of water. The mixture is cooled and treated with excess of  $\text{H}_2\text{SO}_4$  when a clear solution is obtained. Acetyl stibanilic acid dried similarly is weighed and then dissolved in excess of alkali. The former acid solution is then gradually treated with  $\text{NaNO}_2$  solution till it gives a blue coloration with the starch-iodide paper. The alkaline solution of the acetyl stibanilic acid is also cooled in ice and then gradually added to the diazotised solution. It is then filtered after allowing the little quantity of froth to escape. The sodium salt is then precipitated from the concentrated solution by absolute alcohol—dried over porous plate in a vacuum dessicator.

The product is a brown powder, dissolving in water to a clear red solution with neutral test.

Composition :—

Dried material.

Calculated for  $\text{C}_{14}\text{H}_{13}\text{O}_7\text{N}_3\text{Sb}_2\text{Na}_2$ —N=6.76%, Sb=38.6%

Found N=7.0%, Sb=38.1%

(7) P-hydroxy-phenyl-stibinate of urea.

4— $\text{OH.C}_6\text{H}_4.\text{SbO}_3\text{H.NH}_3.\text{CO.NH}_2$ .

P-stibanilic acid which is obtained from acetyl p-phenylene diamine is made into a thick paste with water and the excess of  $\text{H}_2\text{SO}_4$  added, the mixture being cooled. A solution is produced in this way which is well stirred while  $\text{NaNO}_2$  solution is gradually added till it imparts blue colour to starchiodide paper immediately. The mass is next dissolved in alkali after gentle warming to liberate all nitrogen and filtered. The filtrate is reprecipitated with acetic acid. The mixture is filtered and well washed with water. The hydroxy-phenyl-stibinic acid thus obtained, which can also be directly obtained from p-amino-phenol by applying Bart's reaction, is then well mixed with little excess of urea and heated on water bath when a red clear solution is obtained. It is then filtered and precipitated by acetone and dried in vacuo over porous plate.

The product is a yellow powder readily dissolving in water to a perfectly clear solution which is faintly acid to litmus paper.

Composition :—

Dried material.

Calculated for  $\text{C}_7\text{H}_{11}\text{O}_5\text{N}_2\text{Sb}$ —N=8.7%, Sb=37%

Found N=9%, Sb=37.6%

*Therapeutic.*

The therapeutic value of these compounds, if any, will be reported later on.

References.

- (1) Indian Journal of Medical Research, Vol. X, No. 2, Oct. 1922; Vol. XI, No. 1, July 1923; Vol. XI, No. 11, Oct. 1923; Vol. XI, No. 4, April 1924; Vol. XII, No. I, July 1924; Vol. XII, No. 2, Oct. 1924; Vol. XII, No. 4, April 1925; Vol. XIII, No. 1, July 1925; Vol. XIII, No 3, January 1926.
  - (2) Indian Journal of Medicine, June 1926, Sep., 1926.
  - (3) Calcutta Medical Journal, June 1926, Aug., 1926.
-

## The Ṛg-veda in the making.

By MM. H. P. SHASTRI.

In the second chapter of the Second Āraṇyaka of the Aitareya Āraṇyaka, it is said that the ṛsis of the Ṛg-veda were at one time enumerated in the following order:—

- |                      |              |                |               |
|----------------------|--------------|----------------|---------------|
| 1. Śatarcinaḥ        | { I maṇḍala. | 10. Pāvamaṇ-   | } IX maṇḍala. |
| 2. Madhyamāḥ         |              | yaḥ            |               |
| 3. Grtsamadaḥ..II    | „            | 11. Kṣudra-    | } X „         |
| 4. Viśvāmitraḥ..III  | „            | sūktāḥ         |               |
| 5. Vāmadevaḥ..IV     | „            | 12. Mahā-sūk-  | } „           |
| 6. Atrayaḥ .. V      | „            | tāḥ            |               |
| 7. Bharadvā-         | } VI „       | 13. Sūktam.    | }             |
| jaḥ                  |              | 14. Rk.        |               |
| 8. Vasisthaḥ .. VII  | „            | 15. Ārdharcaḥ. | }             |
| 9. Pragāthāḥ .. VIII | „            | 16. Padam.     |               |
|                      |              | 17. Akṣaram.   |               |

This is the whole of the Ṛg-veda. The Ṛg-veda assumed this shape before it was compiled in the Saṃhitā form with 10 maṇḍalas, Nos. 1 and 2 forming the 1st or the Śatarcina maṇḍala, in 191 sūktas. The 3rd is the second maṇḍala, called Grtsa-mada maṇḍala, in 43 sūktas; the 4th is the third maṇḍala called the Viśvāmitra maṇḍala, in 62 sūktas, the 5th is the fourth maṇḍala, called the Vāmadeva maṇḍala, in 58 sūktas, the 6th is the 5th maṇḍala, called Atri maṇḍala, in 87 sūktas, the 7th is the 6th or Bharadvāja maṇḍala, in 75 sūktas, the 8th is the 7th or Vasistha maṇḍala, in 104 sūktas, the 9th is the 8th or Pragāthā maṇḍala, in 103 sūktas, the 10th is the 9th or Pāvamāna maṇḍala, in 114 sūktas, Nos. 11 and 12 form the 10th or the last maṇḍala, in 191 sūktas.

The last 5 items are not included in the Saṃhitā; they are to be found scattered all over the Vedic literature; e.g., a sūkta “Vidā maghavan vidā gātum anuśamsiṣo diśaḥ” is the yoni-rk of the Mahā-nāmnī sāman. It is in 9 ṛcs and is to be found in the 4th Āraṇyaka of the Aitareya, but not in the Ṛg-veda Saṃhitā. The rk, “Rtaṃ satyaṃ Paraṃ Brahma” is not to be found in the Ṛg-veda, but is uttered by all Sāma-vedī Brāhmanas in their Śandhyās. Similarly, Rñ-mantras in Ārdharchas, Padas and Akṣaras, are not to be found in the Saṃhitā, but in the rituals of Vedic literature.

The second chapter of the Second Āraṇyaka of the Aitareya contains information about a collection of Rñ-mantras from

one-syllable mantra to a mantra of 52 res, viz., "Asya vāmasya patitasya" (Rg-v. I, 164.).

This was the state of the mantras of the Rg-veda when the Second Aitareya Āraṇyaka was composed. Subsequent to this, the Rg-veda was compiled in ten maṇḍalas. As we find them, these ten maṇḍalas follow generally the lead of the Aitareya Āraṇyaka, except in this that the first two items of the A.A. were comprehended in maṇḍala I, and the 11th and 12th, in maṇḍala X.

The Maṇḍala compilation follows the order of the Aitareya divisions. The first 51 sūktas of the 1st maṇḍala are called Satarcinas, because each ṛṣi of this portion of the Rg-veda composed about 100 res, therefore they are called Satarcinas. The sūktas from 52-191 of maṇḍala I by various ṛṣis, e.g., Gautama, Agastya, Jamadagni, and so on, are called Madhyamas; because the contribution of each ṛṣi is not so large as that of the family-maṇḍalas (II-VIII) and not so small as that of the Satarcinas. In the 11th and 12th divisions of the A.A. are Kṣudra-sūktas and Mahā-sūktas. But in the 10th maṇḍala, the Kṣudra-sūktas crowd at the end. In fact, after the first-half of the maṇḍala, the sūktas diminish in volume,—from 15 res to 3; though there are some deviations from this general rule. All the maṇḍalas together of the Rg-veda Śākala-śākhā contain 1017 sūktas, and the study of the various arrangements they have undergone is interesting and instructive. Taking the family maṇḍalas as the nucleus, additions were made on both sides, in the beginning and at the end, till the whole was balanced with 191 sūktas in the 1st and 191 sūktas in the last maṇḍalas.

But the most interesting step taken in the arrangement of the sūktas of the Rg-veda is its last revision into 8 aṣṭakas of 8 pādas each. The same 1017 sūktas of the Maṇḍala division, which was an unequal division,—some having 191 sūktas while another only 43,—into 64 nearly equal parts is an extraordinary thing. The Maṇḍala division is a historical division, while the Aṣṭaka division is an educational division,—divisions into lessons. While the history of the Maṇḍala division was lost into obscurity of past ages, that of the Aṣṭaka division is a historical one. It was done by the Brāhmaṇas of Pañcāla some centuries before Buddha. In Vātsāyana's Kāma-sūtra, (Bk. II, ch. 2)<sup>1</sup> the Pañcālas are said to have sub-divided the ten phases of the act of union between a man and a woman

<sup>1</sup> कलानां चतुःषष्टितान्तासां च संप्रयोगांगभूतत्वात् कलासमुद्भो वा चतुःषष्टिरिति ऋचां दशतयीनां च संज्ञितत्वात् । इहापि तदर्थसंबन्धात् । पञ्चालसंबन्धाच्च बह्वचरेषा पूजार्थं संज्ञा प्रवर्तिता इत्येके ।

into 64 sub-divisions or kalās, and there the Sūtra-kāra says that the Pañcālā people are in the habit of splitting 10 into 64, as they had done about the Rg-veda where they had divided 10 maṇḍalas into 64 adhyāyas. Since then both the Maṇḍala and the Aṣṭaka divisions are in vogue.

The commentary makes it clear and says :—

अत्र हि गौतादयः कलायतुःषष्टिरुक्ता । ततस्तत्समूहो वा संप्रयोगाङ्गम् । चतुःषष्टिः संप्रयोगिके वा शास्त्रिकदेशे वर्तते । तत्र हि पाञ्चालिकौ चतुःषष्टिः कथ्यते । कथं ताश्चतुःषष्टिरित्याह—दशतयीनां चेति । दशवयवा मण्डलानि यासान्दचास् । इत्यवयवे तयप् । दशतय्यस्ताश्चतुःषष्टिरिति संज्ञिताः । इहापीति संप्रयोगाङ्गे । तदर्थसंबन्धादिति दशवयवमण्डलार्थसंबन्धात् । चतुःषष्टिरिति संज्ञा प्रवर्तते इति संबन्धः । संप्रयोगाङ्गं हि दशवयवाः । यथोक्तम्—“आलिङ्गनं चुम्बनदन्तकर्मनखक्षतं सौत्कृतपानिषातम् । संवेदनं चोपहतोपरिष्ठं नरायितं चेति दशाङ्गमाहुः ” ॥ इति । पञ्चालसंबन्धाच्च प्रवर्तिता । पञ्चालेन महर्षिणा ऋग्वेदे चतुःषष्टिर्निगदिता । वाश्वेणेऽपि पाञ्चालेन खड्गते संप्रयोगिके अधिकरणे आलिङ्गनादय उक्ताः । ततश्च द्वयोरप्येकगोचरनिमित्तसमाख्येन पाञ्चालेन निगदनात् संबन्धोऽस्ति । पूजार्थेति । उभयोरपि पक्षयो ऋग्वेदैकदेशवर्तिन्यपि संज्ञा बह्वृचैरशिष्टाचारैरालिङ्गनादिषु पूजार्था प्रवर्तिता । केचिदाहुः— “तत्पूजां च वक्ष्यति—

“विद्वद्भिः पूजितामेतां खलैरपि सुपूजिताम् ।

पूजितां गणिकासंघैर्नन्दिनौ को न पूजयेत् ॥ ” इति ।







On a "Drop-Door" Fishing Trap used in the Myitkyina District, Upper Burma.

By B. CHOPRA.

(Read at the meeting of the Sixteenth Indian Science Congress and published with the permission of the Director, Zoological Survey of India.)

While investigating the fauna of the Indawgyi Lake and its connected streams in Upper Burma in the winter of 1926 special efforts were made to study the methods of fishing and the fishing appliances used in the area. The Indawgyi Lake has a rich fish fauna, and there are, consequently, a number of important fishing centres in the locality.

The Indawgyi<sup>1</sup> is a very extensive freshwater lake, being about 16 miles long and as much as 5 miles broad, and is connected with the water-system of the Irrawady through the Indaw river, which flows out of the lake at its north-east end. The Indaw after flowing for a dozen miles or so is joined by another stream, the Namting, and at the confluence of the two lies Chaungwa, the most important fishing village in the locality, on account of the rich fisheries flourishing there.

By far the largest quantity of fish is caught round about Chaungwa in large fishing enclosures that are set up in the course of the rivers, but netting and trapping of fish is also extensively pursued. The traps, or *myon* as they are called, are placed in the course of the streams near the banks, especially in the midst of vegetation, and are responsible for a great deal of fish caught in the locality. The trap most commonly used in the locality is the *kathey myon*, and is supposed to have come from Manipur<sup>2</sup> in Assam. But the *kya myon*, or the drop-door trap, that forms the subject of this note, is supposed to be indigenous. It is perhaps not quite as efficient as the Manipuri trap and is, no doubt for that reason, being gradually ousted by the latter.

The *kya myon* works on the same principle as a rat-trap does—the door drops down with a snap as soon as the victim, a rat in the case of a rat-trap and the fish in the case of a *myon*,

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<sup>1</sup> For physical features of this lake see Chopra, *Journ. Proc. Asiatic Soc. of Bengal*, (N.S.) XXII, p. 203, (1926).

<sup>2</sup> Hora in his account of the fisheries of Manipur (*Rec. Ind. Mus.*, XXII, pp. 209-214, pls. xi, xii, 1921) does not describe or figure any trap like the "Manipuri trap" as used in Upper Burma.

happens to touch the spring. It is a long cone-shaped basket, the major portion of which is made out of a single piece of bamboo, and has a wide mesh. The narrow end of the basket is formed of a bamboo node; the stem is split up into long narrow strips, which, with other spare ones inserted in between, form the long axis of the basket. These strips are woven together in the form of a cone-shaped basket with other strips going round, but leaving a very wide mesh. At the large open end, a double rectangular or squarish frame is fitted up, through which a door made of strong bamboo matting or bamboo strips woven together slides up and down. By the sides of the door two long poles are fixed vertically, one on each side, and the door-frame is further strengthened by shorter bamboo sticks tied near the base. The long poles are grooved to allow of the door sliding up and down. The door has at about the middle of its upper side a pocket-like structure fashioned out of bamboo strips and in this is placed a fairly heavy stone. A long cane string is tied to the upper side of the door and passes over a roller (formed by passing a stick through a hollow piece of bamboo) fixed horizontally between the vertical poles near their upper end. At the free end of this string a small stick is tied. Inside the net at about its broadest point a number of cane strings fixed to the bottom of the net at different points are brought up above the net and tied together to a small bamboo stick. At this point, on the outside of the basket, there is a small loop made of cane string and with its help the two small sticks—one at the end of the string connected with the door and coming over the roller and the other at the end of the inner strings—are so adjusted that even a comparatively light touch to one of the strings inside the basket releases the door string and the door, weighed as it is with the heavy stone, comes down with a snap. A small loop, behind the ramification of the strings, is used for tying a bait to it, and any fish of a large size in trying to reach the bait is almost sure to touch at least one of the strings. Once this happens the door is automatically released and it is impossible for the fish to get out.

The trap is used for catching large fish only and is fixed in fairly deep water, where it is totally submerged, only a part of the vertical poles being visible above the surface.

The *kya myon* appears to be rather a crude trap as only one fish can be caught at a time and once the door is released, even by some floating piece of wood, etc., it ceases to function until it is set again. The very large mesh precludes the possibility of any small fish being trapped. On account of the amazing richness of the fish-fauna in this area, however, this trap has its uses and a fairly large number of fish are trapped by it. Also the large size of the fish that are caught in this trap must be a strong inducement in favour of its use as opposed to the other kinds of traps in which a large number of comparative-

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"Drop-Door" Fishing Trap.

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ly small fish are caught. As stated above, however, this trap is gradually falling out of use. One man generally uses 10-15 of these traps, clearing them, with the help of a small boat, twice a day, in the morning and evening.

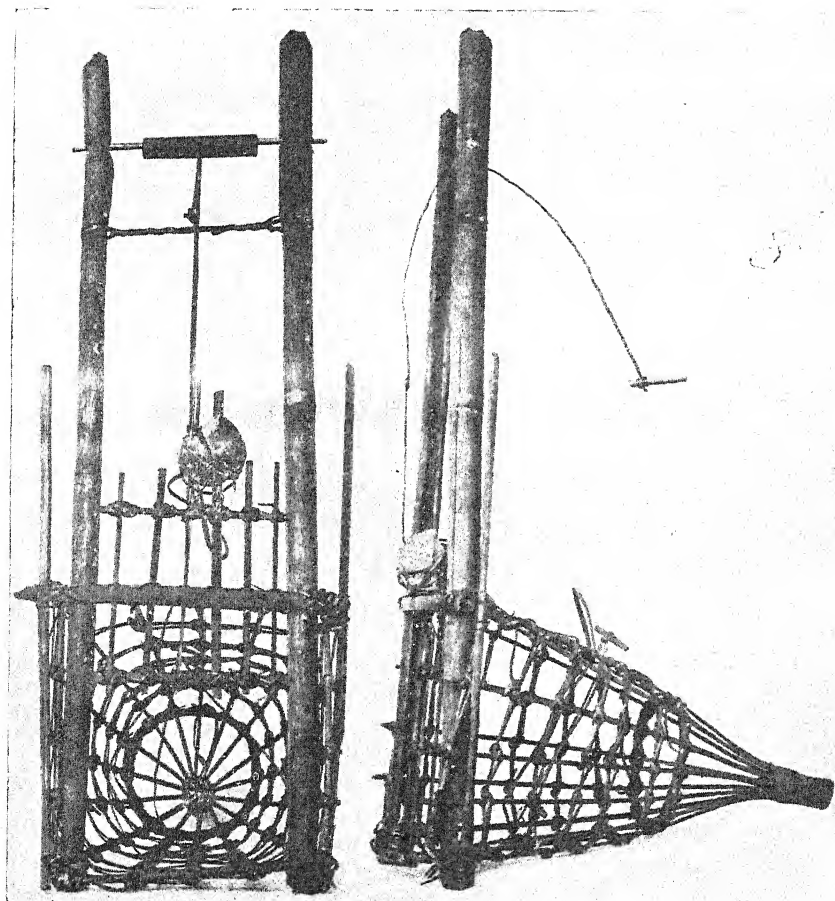
The tax for each *myon*, I was told by the Headman of Chaungwa, is Rs. 2/8/-per year.

*Kya myon* is made in different sizes, but a fairly large specimen examined had the following measurements:—

|                                     |    |                    |
|-------------------------------------|----|--------------------|
| Greatest length of the basket       | .. | 50"                |
| " breadth a little behind the mouth | .. | 19 $\frac{3}{4}$ " |
| " Length of door-frame from inside  | .. | 15 $\frac{1}{2}$ " |
| Height                              | .. | 11 $\frac{3}{4}$ " |
| Height of vertical poles            | .. | 78 $\frac{1}{2}$ " |

The photographs accompanying this note are from a model of the trap made by a fisherman at Chaungwa. The right hand figure shows the trap in side view, with the door closed; that on the left is from front and shows the door open.





Upper Burma "Drop-Door" Fishing Trap.